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Big Sky

Clearwater

Published jointly by Montana Water Environment Association, Montana Section
American Water Works Association and Montana Department of Environmental Quality

FALL 1996

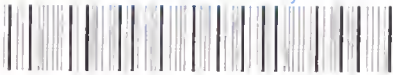
WQD MISSION STATEMENT:

"Maintain and improve the quality of Montana waters to protect the public health and the environment."

SO LONG, WQD. HELLO, DEQ.

We've changed the way we look, but our mission still remains: 'Protect Montana's waters from the mountains to the plains.'





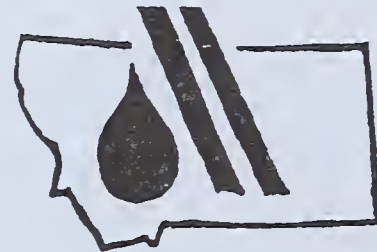
This publication welcomes articles of interest and random pieces of information regarding anything to do with water. If you have ideas or information you would like to share with other people involved in the water and wastewater field, please contact the Montana Department of Environmental Quality.

An article may consist of your thoughts and ideas about something you may have experienced, perhaps such information could help someone else in their day-to-day work. It could also be a technical article developed from research information and library resource material. If it has to do with water and you think it may be of interest, please send it to us (Attn: Editor) or give us a call at (406) 444-2406.

If you do not wish to continue receiving this publication, please send us your mailing label so we may remove it from our mailing list...thanks.

Big Sky Clearwater
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Helena, Montana 59620-0901

Cover: A portion of the poster, "WATER: The Resource That Gets Used & Used & Used for Everything!", by Water Resource Education.



The *Big Sky Clearwater* is for water and wastewater operators across Montana. It is published twice a year by the Montana Department of Environmental Quality, in cooperation with the Montana Section of the American Water Works Association and the Montana Water Environment Association.

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WHO'S ON FIRST...?

by Bill Bahr

Planning, Prevention and Assistance Division

It is truly an awesome task we share in working to protect and preserve our environment for future generations to enjoy. The water and wastewater treatment professionals spread throughout the cities and towns of Montana work hard to carry out the tremendous responsibility of providing safe drinking water and treating the wastewater for Montana's citizens. Working right along with the operators is the Department of Environmental Quality (DEQ).

DEQ has legal responsibility for dealing with virtually every issue related to environmental protection. DEQ is made up of the Environmental Sciences Division of the former Department of Health and Environmental Sciences, and portions of the Department of State Lands and the Department of Natural Resources and Conservation.

Most of you reading this have developed a list of people working for the state who help you with your discharge permit, or your water sample, or most any other water or wastewater treatment problem. I'm sure that it will take a while for you to get used to calling DEQ and hearing the receptionist ask which of the following divisions you would like to reach:

Planning, Prevention and Assistance,

Permits and Compliance,

Enforcement, or

Remediation.

You may not recognize any of these names, and probably will try to reach the individuals you have worked with in the past, like, John Camden or Rick Cottingham. That should work okay, but it is also a good idea to know where all the folks you're familiar with are located now in the newly created DEQ.

Public Water Supply is part of the Permitting Division. This includes all the same cast of characters who were with Public Water Supply in the old DHES.

Operator Certification is also in the Permitting Division. You can reach Shirley Quick at her same phone number, or by getting through to Permits.

Wastewater Assistance is in the Planning, Prevention and Assistance Division. That's where you will find me, or any of the wastewater engineering bunch, including our new Pollution Prevention Specialist --- Mike Abrahamson.

Wastewater discharge permits will be issued from the MPDES program located in, where else, the Permitting Division.

If you have any questions, please contact Bill Bahr at 444-5337.

REFLECTIONS IN THE RIPPLES

Big Sky Clearwater, Fall Edition 1996 Editor, Bill Bahr

I enjoy this opportunity to address the readers of the Clearwater the most out of all the hectic and stressful time it takes to edit and publish this journal. The responsibility to carry on the quality work done by all those talented people who preceded me at this position is an awesome feeling. I seriously doubt that my efforts match those earlier ones, but we try, and that's the best we can do. This issue contains an article on groundwater systems, thoughts from a departing friend and advisor, the agenda for the 63rd Annual Fall Water School, a look back at the Joint Annual Conference of MWEA and MSAWWA, and many other interesting pieces. So, please dig in and enjoy this 1996 Fall Big Sky Clearwater.

Environmental Trainer Award

As a certified water and wastewater operator, I have been fortunate to attend many wonderful training sessions both in Montana and elsewhere. I have even done a little training myself, and, along the way, I became a Certified Environmental Trainer (CET). Doris Roberts and Steve Cheman preceded me as CETs in Montana, while Dr. Martha Anne Dow helped establish the National Environmental Trainers Association (NETA), the sponsoring group for CETs.

Dick Pederson and Dr. Howard Peavy got me started in training in the mid-1980s; of course, with full support from David Brown, the EOS/Great Falls WWTP plant manager. I remember well that first class at the Fall Water School at MSU when I made a presentation on Safety. I was nervous and I'm sure that the sound of my knees knocking together drowned out my voice. But, I got through it, and met Tim Hunter and Jan Cranor, that Water School's organizers from the Water Quality Bureau (WQB). Denise (Osterman) Ingman worked for the WQB, planning and coordinating continuing education events for certified operators. Donna (Howell) Jensen and Scott Anderson helped establish the Montana Environmental Training Center (METC) with Northern Montana College and organized and provided training. Jim Melstad has been involved in all aspects of operator certification and continuing education for many years.

All in all, my experiences from attending, organizing and presenting training for certified water and wastewater treatment system operators have been memorable and, for the most part, wonderful. In recognition of the benefits that all Montana operators have received from listening to those folks listed above, and all the trainers that space will not permit me to list, an annual Environmental Trainer award will be presented during the opening session of the annual Fall Water School for Operators and Managers. The 1996 recipient will be announced Monday morning at the fall school. Please attend to find out who it is.

Environmental Compromise

When we discuss environmental issues, there are as many opinions about what we should do as there are people. The range of views of natural resources extends from one edge of the spectrum, where virtually no human impact would be allowed, to the other, where natural resources would be valued only for the products that could be generated. Somewhere in the middle of these extremes lies a compromise that encompasses some of both. Lacking the ability to look far into the future to see the effects of the human race on our environment, we have to try to strike a balance that preserves ecological systems forever. My sense of where we're going and where we've come from says we can't stop development; but, we can help it happen in a safe and sound manner. As more and more people populate the areas that heretofore held far fewer numbers, and as we extract products from the earth's resources to maintain our lifestyles, impacts will be felt and noticed. An outhouse on the side of the hill won't work as it did when I was a boy growing up in cattle country north of Chinook. Wastewater treatment systems now are necessary to handle increased water usage.

For a variety of economic and social reasons, multiple-use of resources will not go away. Compromise will dictate that human beings must learn to change behavior, too. For example, whether or not you like snowmobiles, if snowmobiling is allowed into areas that are fragile with regard to noise, air pollution, and other degradations, then we should learn to voluntarily snowmobile there less often. Only by allowing others to experience those things that we truly enjoy, can we call it sharing the resource. Only by self-limiting the activity can we call it sparing the resource. If we all wanted to swim at the same spot on the Madison river at the same time, that resource would truly be impacted. So, we all must be aware of the need to rotate our visits to our favorite haunts so that others can go there, too. We need to voluntarily limit our usage, and visits, so the resource can continue to be as wild and beautiful as it is today. We need to limit the sheer numbers to lower the pressure on wilderness and on wild life. What if there was no catch-and-release?

In our communities, we are learning to conserve water usage; eventually all water resources can be used up or impacted to the point of no use possible. In our lives as human beings, we are learning to take only what we need and put a little back for the next person. Reminds me of the story about how you prime the pump: when you come to a hand-pumped well, and there's a small jug of water hanging in the well, you can choose to drink the water or use it to prime the pump and pump plenty of water up to drink, leaving the little jug full for the next thirsty wanderer. What do you choose to do?

The EYE of the Beholder

In my travels around the state to inspect wastewater treatment facilities, I've been both pleasantly surprised and surprised unpleasantly by the condition of the plants. Most of the large communities have plants that anybody might find nice to tour. I suspect that civic leaders in those cities demand that their wastewater facilities look like the millions of dollars they cost to build. Smaller communities are probably hard pressed to hire enough staff to take care of all the community public works needs. Nevertheless, the wastewater

treatment facilities in many small towns are in excellent condition: the dikes are mowed regularly, with no weed, brush or cattail populations; influent, effluent and intercell structures and valves are lubricated, operated and maintained; collection system piping and lift stations get periodic attention and cleaning; fences and signs keep unwanted visitors out; and, the flow measurement device is clean and accurate.

How about those that aren't in such great condition? Solids levels build up causing discharge violations. Brush and small trees have roots that penetrate the lagoon liner, leaking pollutants to ground water. Valves, if they can be found in the tall weeds and grass are often not functional. Discharges occur at facilities that aren't supposed to discharge. Erosion has washed most of the bank soils into the lagoon. Flows to the ponds are often far in excess of design because collection systems are old and take in ground water. Poor fences allow animals to wander all over the dikes and to fall into the lagoons. Burrowing animals cause dike failures. Odors persist because scum mats build up in the weeds. Poor treatment results because of little wind action (weeds, trees, brush cover, etc.) and limited sunlight exposure (shadowing, scum cover, etc.). And, the list goes on. Pretty much a place you wouldn't want to work at, much less take the city council or other visitors. Out of sight, out of mind. It is only the wastewater treatment plant, after all.

Wastewater treatment plants have a bad reputation, and, sometimes, deservedly so. Lagoons often emit odors during spring turnover and prolonged cloudy, cool, wet springs. The stuff in the water isn't pleasant to work with. The whole concept is basically repugnant. So, why worry about what the appearance of the WWTP is like? Just don't go out there and everything is hunky-dory, right? Well, as I noted above, ponds with high weeds and badgers and failing dikes are not just ponds that look bad, they also perform bad. Ask the citizens of any community if they want to send their pollution into the local stream or lake, or if they want to impact their own drinking wells by sending pollution out through lagoon bottoms into the local ground water drinking supply. I'm not making up any of these scenarios, by the way, Montana has had plenty of these kind of environmental problems from lagoons.

The image of your wastewater treatment plant is the image your community projects, both to visitors and to your environment. That's not to say, if it looks good it's working good, but rather the reverse. Your image as a professional operator depends on the facility you're responsible for. Small system operators take care of parks, public water supply, streets and other things that have to look good and work good. The wastewater plant is the same. If you want support for your duties as the wastewater operator, you need to provide information about the importance of the WWTP to the citizens whose health depends on it. They need to know that a community's health requires a good infrastructure. That requires money to support the staff, money to keep up the collection and treatment system, and money to replace the system when it is worn out. Time must be allotted to the operator to carry out these important duties. No community will survive without an effective wastewater treatment system. The community environment, the rivers and streams, the wells and public water supplies, are all dependent on the wastewater treatment plant to do a good job of removing pollution and diseases from that wastewater. Good operation and maintenance is necessary for that to happen. Then the plant will LOOK good.

4th ANNUAL SPRING SCHOOL FOR SMALL SYSTEMS



Touring Lewistown's drinking water source (Big Spring) at the 4th Annual Spring School.

Forty-eight water and wastewater operators along with other environmental professionals attended METC's 4th Annual Spring School for Small Systems in Lewistown March 13-15, 1996 at the Yogo Park Inn.

Attendees participated in quality workshops in the areas of pumps and motors, trenching, confined space safety, gaseous, liquid, and pellet chlorination, communication with your local government, leak detection, solids testing for wastewater, lead and copper update, corrosion control, well construction, wellhead protection, DO, pH and flows in wastewater, the microscopic examination of wastewater, collection system operation and maintenance, bacteriological sampling for water and much, much more.

One highlight of the school included tours to the Lewistown wastewater treatment facility and the Lewistown water system. Both tours were very interesting and added a "real life" aspect to compliment the school's training. Thank you Lewistown for a job well done.

Another highlight at spring school was the successful basic training tract which has been developed for attendees who plan on taking certification exams on Saturday after spring school. Topics covered in the basic tract included lagoon systems, mechanical wastewater systems, water math, water chemistry, hydraulics, loading rates, and scientific terms. Thirteen people took exams on Saturday.

Thank you to all the speakers and attendees for making our 4th Annual Spring School a success. We heard of some great ideas for the 5th Annual Spring School. Anyone who has ideas on topic areas for the 1997 Spring School please contact METC.

CHLORINE GAS PRECAUTIONS

by Rick Cottingham

Each year Montana has numerous incidents of injury resulting from chlorine gas leaks. Nothing replaces taking a Chlorine Safety Course. However, since this occurs on an annual basis here is some useful chlorine gas information and some helpful safety tips.

Information

Chlorine gas is commonly used to disinfect drinking water and wastewater effluents. It is important that you understand what hazards may exist in the chlorine tank room and take the necessary precautions associated with gas chlorination.

Exposure effects, by either skin contact or inhalation, can vary from irritation to death. The slightest smell could indicate a leak and leaks never stop; they have to be repaired. Chlorine gas burns the eyes and can irritate the skin in small contact-type exposures. Inhalation of chlorine can cause severe irritation to the nose, throat, and respiratory system.

Chlorine gas is about two and one-half times heavier than air and is a greenish-yellow color. Chlorine has a very sharp offensive odor. Chlorine readily combines with water to form hydrochloric acid, which is very corrosive and if inhaled causes painful lung congestion and possibly suffocation and death.

Safety Measures

If you feel you have been, or are being, exposed to chlorine, HOLD YOUR BREATH or BREATHE SLOWLY so as to damage the least amount of lung tissue as possible. Then WALK, DON'T RUN, out of the area; COVER your mouth and nose as best you can.

The "Ten State Standards for Water Works" suggests the following safety guidelines for the tank room:

- * SCBA equipment be located outside of the tank room with a minimum of 30 minutes of compressed air supply. **Know how to use it and maintain it!**

- * Keep a bottle of Ammonium Hydroxide with a 56% percent ammonia solution readily available for leak detection. If you use one ton cylinders have a leak repair kit approved by the chlorine institute. **Have someone trained to use it!**

- * Provide continuous chlorine leak detection equipment, with **both** an audible alarm and a warning light. If it activates, be careful. **If you have a leak get help to repair it; DO NOT DO IT ALONE!**

* Provide a **separate** room for chlorine cylinders, with crash or panic hardware. Doors **must** open outward. A window must be provided for viewing all equipment and the entire floor area. **Always look through this window before entering this room alone!**

* Chain all tanks securely to the wall in a room isolated from the operating area. Store empty and full tanks out of the direct sunlight. Do not expose tanks to extreme heat and maintain the temperature in these rooms at 60 degrees F. **Keep tank storage separate from ammonia storage. Never store other chemicals, paint, oil, grease, or other hydrocarbons with chlorine.**

* Have an emergency exhaust fan in each chlorine room to prevent an accumulation of chlorine gas. Install this fan to draw air from the lowest floor area of the room. **Do Not** locate the fan near the fresh air intake. **Turn the fan on prior to entering the room. Wait approximately two minutes before entering the room.**

Caution must be exercised before entering a chlorine room!

* Fan and light switches must be accessible from outside the chlorine tank room. Cautiously check the fan exhaust from outside the chlorine room. Check the fan exhaust louvers periodically to ensure there is no blockage.

* If you detect an odor or see the yellowish-green gas you must make an assessment prior to turning on the exhaust fan, as to whether or not it is safe to exhaust the accumulated chlorine gas from the room. **Is the concentration large enough to endanger nearby populations or animals? If you don't know or are not sure, don't exhaust the gas; GET HELP!**

* Be sure this room openings are completely sealed off from all other work areas and inspect periodically to be sure nothing has cracked.

* When changing a chlorine cylinder make sure that only lead gaskets are used each time a cylinder is changed. **Get rid of any other gaskets.**

* When changing the cylinder, use the ammonia solution to check for leaks during the changing process.

If a leak is observed, personnel should: (a) notify the agency designated in your contingency plan (or the fire department); then (b) have a qualified (trained) person repair the leak. Notify the Department of Environmental Quality, Public Water Supply program as soon as possible at 406-444-4549.

FLOODING AT THE LIVINGSTON WWTP

by Steve Briggs

The flooding early this summer on the Yellowstone river had many severe impacts on property, towns, homeowners and others. This flooding event was one of the worst in the history of the Yellowstone valley. It was particularly damaging to the City of Livingston and its residents. News reports cited many examples of threatened water supplies, homes and health of people in the area. Wastewater plants typically are built near rivers because that is where the communities tended to spring up and just downstream is the logical place to discharge the treated effluents. The wastewater treatment facility for the City of Livingston was also subject to effects of the extremely high waters of the Yellowstone.

Steve Briggs, Chief Operator for the WWTP, was forced to deal with the high river levels at the wastewater treatment plant. He filed this report with the Montana Department of Environmental Quality.

During the month of June, on the fourth day, the Yellowstone River was above flood stage and the wastewater treatment plant was experiencing the high water. The emergency by-pass pond was taking in water from the river through the discharge line that should allow water to flow to the river. The static level of the river was much higher than the pipe. The staff at the plant dug a trench from the pond to the swamp area on the plant, which is approximately fifty feet from the edge of the pond. (They also constructed dikes to protect the integrity of the lower plant structures. Paul LaVigne and Bill Bahr from MDEQ stopped at the plant on June 10 and took the following pictures.)

The wastewater temperature was checked at the time of the diversion and was recorded at 59 degrees Fahrenheit, so we decided to chlorinate. The water in the chlorine contact chamber was higher than the concrete diversions, so the chlorine was injected in the front part of the chamber and mixed with the incoming river water before entering the by-pass pond. We maintained a chlorine residual of about 0.20 ppm and rechecked the water that was going into the swamp and the chlorine was zero.

We maintained the flood control until June 16, 1996. We never went out of compliance with effluent BOD₅, but our influent BOD₅ was low from the infiltration and our 30-day percent removal was 82 percent. We had 4 manholes that were under water from the flood that gave us alot of extra water to treat. Our highest flow was 2.74 MGD. Our design flow is only 2.0 MGD, and from June 9th to June 19th we were above the 2.0 MGD level.

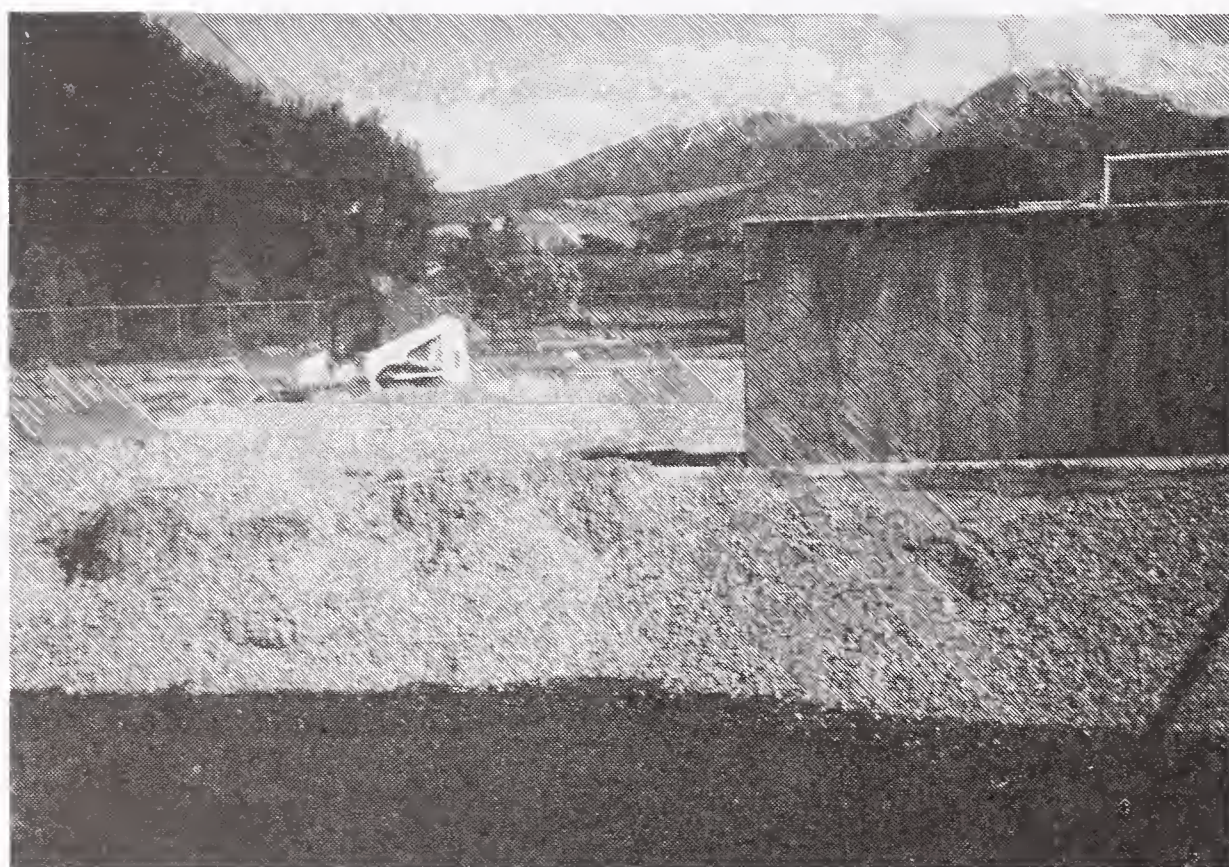
Steve stresses in his letter to us that, "Not at any time did we by-pass raw sewage to the river as was mentioned at the state." I recall news reports that did indicate someone from DEQ may have been quoted as saying the WWTP at Livingston was by-passing raw sewage, but from all that I saw, Steve and his staff did a good job of protecting the environment, the public health, and the valuable wastewater treatment infrastructure.

It is always important to have an emergency plan ready ahead of time to help deal with natural disasters or civil emergencies. Please take the time to plan what you are going to do to protect the facilities that are so important to the health of the citizens in your communities.

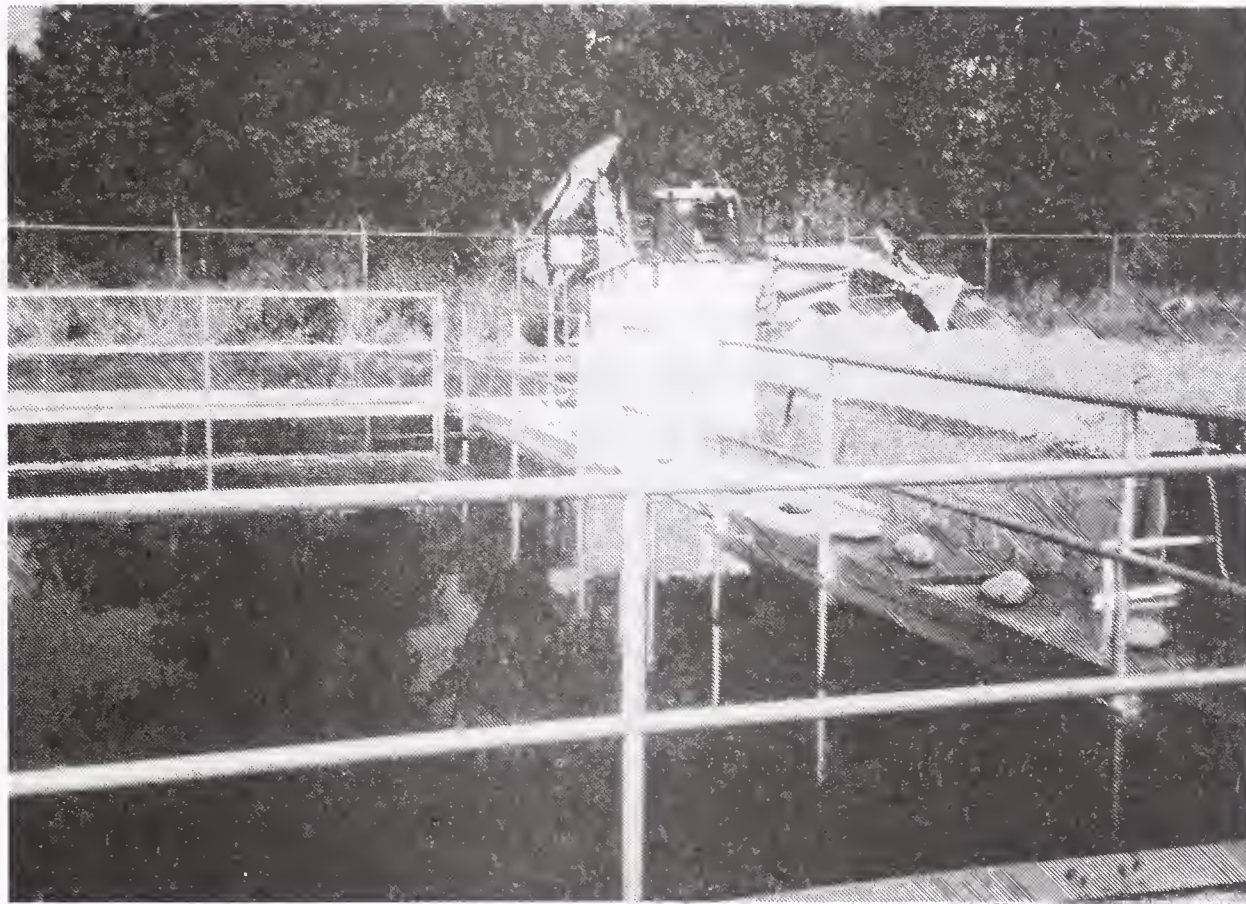


◀ *The flood across the road from the WWTP.*

Protective flood dikes on the WWTP. See the by-pass pond in the background. ▶

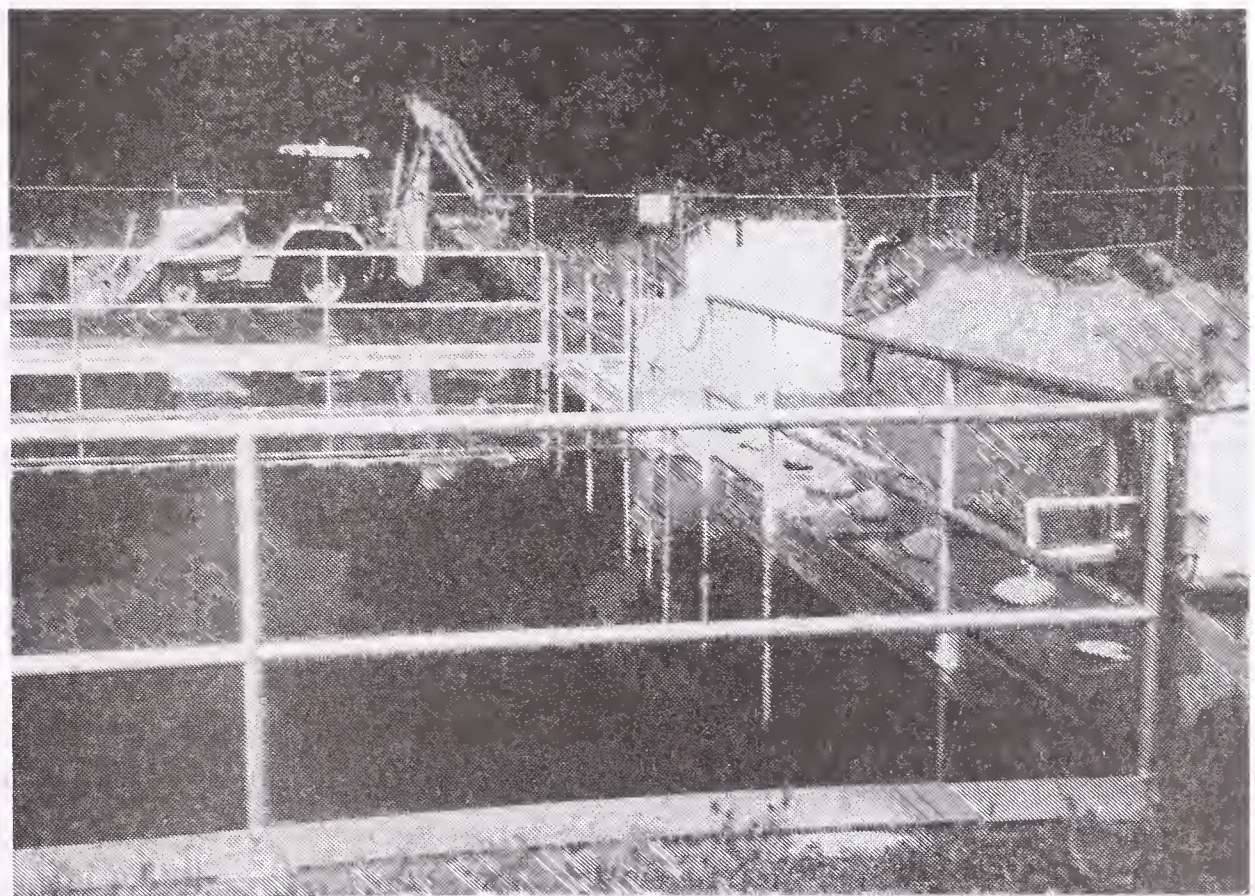


FLOODING AT THE LIVINGSTON WWTP (CONT.)



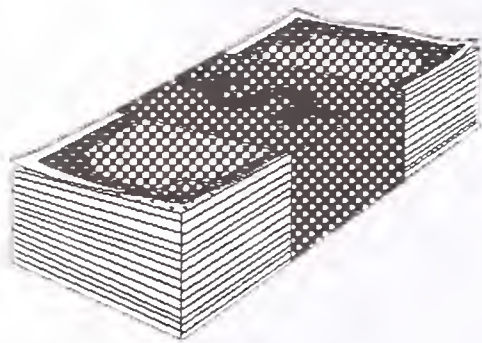
◀ Building protective dikes at the WWTP.

► The water level in the chlorine contact chambers is flowing over the top.



Affordable Financing for Infrastructure Projects

by Barbara L. Neuwerth
Planning, Prevention and Assistance Division
Department of Environmental Quality



Have you been looking for a funding source to fill in where grants funds end? Have you found that interest rates on loans and bonds are higher than your rate payers can afford to pay? Are you ready to seek funding at the lowest possible cost? Look no further! The Montana State Revolving Fund (SRF) Loan Program is for you!

What you've got!

Since 1991 the Montana State Revolving Fund Loan Program has provided low-interest loans for 30 water pollution control projects, specifically wastewater related projects. We are not only continuing to offer low-interest (4.0%) loans for up to 20 years for wastewater projects, but also expanding the uses of wastewater SRF to offer you additional sources of funding for water pollution control projects. Read on to find out what is new with the SRF!

What you can anticipate!

During the upcoming Montana Legislative session amendments to the existing statute will be proposed to clarify definitions of terms and provide authority for the Wastewater SRF to fund Nonpoint Source (NPS) Pollution Projects (including landfills). In the past, sources for funding landfill repairs, expansions, closures, etc., have been almost non-existent. The SRF has recognized the need for affordable funding sources for these projects and is taking action to assist you by providing a low-interest source of loan funding your

community's landfill projects. If you anticipate the need for landfill funding in your community and desire to have an additional source of financing for these projects, please support the amendments to the Wastewater Treatment Revolving Fund Act during the 1997 legislative session.

SRF is working with consulting engineers to make a difference!

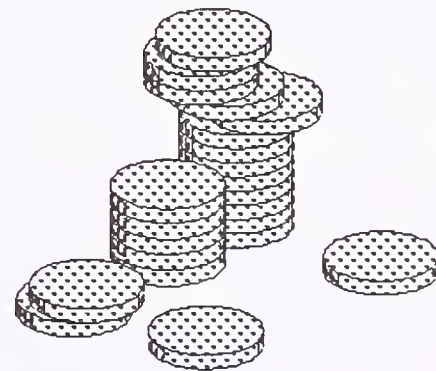
In an effort to save his client's money, a consulting engineer contacted the SRF program and asked if the SRF could be used as a source of "interim financing" for a wastewater project. In response to this question, we researched the possibility, verified it's viability and established criteria to provide interim financing for water pollution control projects. Therefore, "interim financing" is now available for qualifying projects which have a guaranteed permanent source of funding and which need an interim source funding.

The SRF can provide you a loan for up to three years at 3.0% interest with a 1.575% origination and administrative fee. A Bond Anticipation Note will secure the short-term debt. The permanent funding source is required to payoff the Bond Anticipation Note within three years.

Funds are available now for water pollution control projects and applications are accepted at any time! The SRF program currently has an excess of \$30M which can be committed to your water pollution control projects!

So if you need to invest capital in your community's infrastructure now, use the SRF and invest in Montana's future! SRF loan funds used today by Montana communities revolve back into the SRF to be used for future Montana community projects!

To inquire about the program, please call Barbara Neuwerth at 406-444-5322.



THE SAFE DRINKING WATER ACT: Compliance and Reauthorization

by Jim Melstad, Supervisor
Drinking Water/Subdivision Section

Compliance isn't everybody's favorite topic. Compliance with the requirements of the Safe Drinking Water Act can be difficult to understand, expensive and very frustrating. Our experience has shown that the great majority of water suppliers take compliance very seriously. A lack of understanding of the complex requirements is often the only factor that keeps a supplier from complete compliance. The staff of the Public Water Supply Program understands these problems, and we do appreciate your efforts toward meeting the federal and state regulatory requirements.

However, noncompliance is still a serious issue that requires our attention. EPA has requested state programs to focus their compliance efforts on the Surface Water Treatment Rule (SWTR), the Total Coliform Rule (TCR), the Lead and Copper Rule (LCR) and nitrate/nitrite sampling requirements of the Phase 2 and Phase 5 rules. It might be informative to give you a few recent examples of noncompliance that have produced serious consequences.

Because of enforcement staff constraints, we requested that EPA take enforcement action against six water suppliers that had not done nitrate, nitrite or lead and copper sampling during the past three-year compliance period. EPA has initiated enforcement action, which will likely result in administrative orders and possibly penalties.

The new DEQ Enforcement Division has accepted several other requests for legal action against suppliers who have not performed lead and copper sampling. Administrative orders, with possible penalties, will likely be issued.

We issued press releases for about 80 suppliers to notify their customers that nitrate and nitrite monitoring has not been done during the past three-year compliance period. Further formal legal action may be requested.

A water supplier took a routine coliform sample in June that showed the presence of fecal coliform bacteria. The repeat samples were not taken for a week, but one of the repeat samples also showed the presence of fecal coliform bacteria. A boil order was issued, and a newspaper published an article and editorial that were very critical of the time delay in collection of the repeat samples. Customers were very upset, and expressed their anger for several days to the supplier and DEQ.

We have experienced two instances of what were almost certainly waterborne disease outbreaks in the past two years. Wells serving two separate small water supplies appear to have been directly contaminated with sewage. Dozens, if not hundreds, of people became ill. Protection of sources, regular monitoring, and/or adequate disinfection must be practiced to prevent this type of public health emergency.

As mentioned above, a new Enforcement Division has been created within DEQ. Once the backlog of enforcement cases is cleared, additional orders will likely be issued against suppliers

that are out of compliance with the SWTR, the TCR, the LCR and nitrate/nitrite sampling requirements.

On a lighter note, reauthorization of the Safe Drinking Water Act may be imminent. A conference committee has been appointed to iron out the differences between the senate and house bills. Committee members are considering regulatory relief for small systems in addition to relief that has already been included in the legislation. However, the requirements of the SWTR, TCR, LCR and the nitrate/nitrite sampling requirements will likely not be changed, and will become more stringent in some respects.

Our thanks to you, again, for your efforts. Please do not hesitate to call or write, or to contact the other technical assistance providers like MRWS and MAP if you have questions about compliance issues. **HAVE A GOOD SUMMER AND BE SAFE - OBSERVE PROPER PROCEDURES IN TRENCHES AND CONFINED SPACES!**



Affordable Financing for Drinking Water Projects

by Barbara L. Neuwerth

Planning, Prevention and Assistance Division

Department of Environmental Quality

Three and a half years ago, I was asked when Montana would be getting a Drinking Water State Revolving Fund (DWSRF). The answer is: Sooner than you think! The success of the wastewater SRF programs throughout the nation and the need for low-cost funding for drinking water projects has propelled our federal government into developing a **DRINKING WATER SRF!**

The encouraging news is that Montana legislators, during the 1995 legislative session, saw the wisdom in augmenting the limited sources of grant funding in the State with low-interest loan funding. They passed the "Montana Safe Drinking Water Treatment Revolving Fund Act," which will provide low-interest loan funding, in anticipation of federal legislation being passed.

After many go-rounds in Congress, both the House and Senate have passed their respective versions of the Safe Drinking Water Act Bill and these went to a Free Conference Committee to clarify the differences between the two bills. **On August 6, 1996, President Clinton signed into law a rewrite of the Safe Drinking Water Act.**

Now that the final version of the bill has been released, the Environmental Protection Agency has created a Drinking Water Advisory Group which has the wheels in motion. We expect draft initial guidance to be out to States for review in October, 1996, and final guidance to be released in February, 1997. In the meantime, Montana will review its existing enabling legislation and, if necessary, amend it during the 1997 legislative session. Montana will continue development of the Drinking Water SRF by writing administrative rules. Once funding is in place, we anticipate hiring and training staff and making loans! This is fantastic news! You may be thinking, when will Drinking Water SRF project funding be available? My best estimate is August or September of 1997! We will keep you posted regarding the status of the DWSRF! If you want a status report or information, please call Barbara L. Neuwerth at 406-444-5322!

Wellhead Protection Plan Review

by Joe Meek

Planning, Prevention and Assistance Division

Many public water systems have begun to recognize the value of planning for the future by considering the development of a wellhead protection plan. In part, this is because MRWS and DEQ have been very active in getting information about wellhead protection to system operators and managers. But another significant reason we're seeing more and more systems begin development of a wellhead protection plan is because *"it just plain makes good sense."* The concept is easy: 1) find out where your water comes from, 2) identify potential threats located within the source area, and, 3) decide how to manage those threats. While the concept is easy, some of us have a tougher time when it comes to 'putting pencil to paper' which is actually the writing of the plan. A few suggestions follow which may help you see your way through the process. And while you're reading through this article and thinking, *"yeah, I get the concept but I just don't write things down very well,"* give some thought to getting help from someone else you might know who can handle paperwork-type stuff. With everything you've got to do, you maybe don't need an exercise to demonstrate your writing skills. Look around and find someone to help out. A spouse, high school age son or daughter, or perhaps someone else involved with the PWS can help put it together.

Developing a wellhead protection plan is nothing more than taking a series of fairly simple and well defined steps. The whole process may seem complicated but the individual steps are not if they are considered one at a time. It is similar to how we often deal with our water system...we call it a water system but think of it in simpler terms such as the well, valves, distribution system, and service connections. *The whole is more complicated than the individual parts.* DEQ has developed a Wellhead Protection Plan Review Checklist to help you put together your plan and will assist you at any point in the process, all you need do is ask.

In order to certify a wellhead protection plan, a community submits their plan to the Wellhead Protection Program at DEQ for review. The purpose of the review and certification is to verify that your plan meets the requirements of the Safe Drinking Water Act and the Montana Wellhead Protection Program (MWHPP). DEQ will evaluate your plan to determine if it contains the information described in the MWHPP. For those of you considering a monitoring waiver application...remember, a well thought out and documented certified wellhead protection plan can be submitted in place of a monitoring waiver application.

Now, how can the certification checklist help you with your wellhead protection plan. Generally, with your draft plan in hand you compare it with the checklist. An entry is made for each item on the checklist that is covered by your plan. The format prompts you to consider all aspects of wellhead protection planning described by the Montana Wellhead Protection Program. If an item is not checked "yes", you'll need to include an explanation in the space provided. The checklist also prompts you to describe the method of wellhead protection area delineation and to include the technical information that should be attached to your plan to support the delineation.

All the information making up your wellhead protection plan should be consolidated into one package for certification review. Your package should closely follow the outline of the checklist. It is important to include copies of completed inventory forms and any other relevant attachments.

A wellhead protection plan will generally include the following:

- a brief description of the characteristics of the community, public water supply and aquifer that influenced your decisions. This may be a paragraph or so in length.
- a list of the key individuals and groups that participated in the decision making process, and those who will manage the wellhead protection area. This also is a paragraph or so in length.
- a map showing the location of existing wells and sites for new wells and showing the boundaries of the wellhead protection areas.
- well construction and yield information and well log information.
- the contaminant source inventory of the wellhead protection areas in proper format for inclusion in a statewide data base. This may be a few to many pages in length depending on the community.
- the management options selected and include any ordinances adopted. This should include a paragraph or more describing how management options were considered and selected.

- the goals the management options are designed to achieve and a time frame for evaluating the success of implementation. This may be a paragraph or so in length.
- the contingency plan for dealing with emergencies. This is probably a page or so that fully describes your plan of action in an emergency along with a personnel list. Many systems have ideas about emergency response but have never written them down. This section of your plan should describe the general steps to be taken in a manner that someone other than the operator could carry out the emergency plan.

The checklist is used to help determine that all information necessary for certification is included with your plan. You can see a typical wellhead protection plan for a small water system might be 15-20 pages long, which includes attachments such as the well logs, maps, and contaminant inventory. The writing portion many operators get hung up on is a small part for many wellhead protection plans. Don't let a few to several paragraphs of writing stand in the way of wellhead protection plan development.

Joe Meek at DEQ (444-4806) or Bill O'Connell at MRWS (454-1151) can help you get started on wellhead protection or answer questions about how to put a plan together.

WHO IS DOING WHAT IN WELLHEAD PROTECTION

TYPE OF PWS SERVING NON-TRANSIENT USERS	POPULATION SERVED	POPULATION USING PWSs INVOLVED WITH WELLHEAD PROTECTION	% OF TOTAL WITH WHP
Community	258,500	106,900	41%
Non-transient	34,400	2,500	07%
TOTALS	292,900	109,400	37%

Update on the 1996 U.S. EPA Needs Survey

by Gerri Reeves

Municipal Wastewater Assistance Program

Many of you received "needs survey" forms to fill out this spring. Please read on to learn more about the process.

Every even numbered year the U.S. Environmental Protection Agency (EPA) conducts a national wastewater needs survey (although a survey was not done in 1994). The survey documents the capital cost of needed municipal wastewater treatment facilities, and other water quality program needs eligible for funding under the Clean Water Act's State Revolving Fund (SRF) loan program. Other water quality needs being documented include nonpoint source, estuaries, wetlands, stormwater and combined sewer overflows. Congress used the 1992 Needs Survey as a focal point for proposed changes to the formula for SRF allotments to the states. As the Clean Water Act reauthorization proceeds, we are expecting that the 1996 survey results will be used in the same way, thus, Montana communities do have a voice in the process.

There were 217 Montana facilities, or communities, in the needs survey database. During the 1996 survey we added 16 communities, for a new total of 233. Each facility in the database contains demographic data, and other data such as type of wastewater collection and treatment, if any; permitted discharge information; and wastewater system needs and capital costs. The needs are either documented or estimated.

Documenting the needs and costs of wastewater systems is the focal point of the survey. Documentation must be in the form of a facility plan, a capital improvement plan, or other type of engineering study or report. If the needs and costs entered in the database are not documented, then EPA considers the information as *estimates*.

For the 1996 survey, we reported a total of \$157,131,000 in wastewater needs. Of that

amount, \$122,233,000 is supported by documentation.

Of the 233 Montana facilities, 209 have populations less than 3,500, and are considered "small communities" by EPA's criteria. In past surveys, documenting the needs and costs of small communities has been very difficult because they have not had the resources to develop the necessary planning and engineering studies. Thus, the majority of wastewater needs of Montana's small communities have been reported as estimates, and have long been overlooked.

For the 1996 survey, EPA allowed the states to use a special Small Community Needs form for communities with populations less than 1,000. The form required the signature of a local official and an engineer or engineer circuit rider. We mailed the form to 238 Montana communities, facilities or systems and received a response rate of 21%. Nearly half of the surveys which were returned reported needs totaling \$13,744,788.

U.S. EPA will now focus on reviewing the data which has been entered in the database, and by late summer, they will advise the states of any additional information or revisions which are needed. Lastly, a 1996 Needs Survey Report will be developed by EPA and presented to the U.S. Congress when it convenes in 1997.

We are grateful to all the operators and local officials for the tremendous amount of information you provided. During the survey data collection process, we sent out several different questionnaires and surveys in an effort to gather updated information and respond to EPA's requests. Many of you responded to our requests with notes like '*thanks for the opportunity.*' It sure feels good to know there are so many dedicated people working to protect and improve Montana's water quality!

POLLUTION PREVENTION...

...AND YOUR LOCAL WASTEWATER TREATMENT SYSTEM

by Bill Bahr

Wastewater treatment plants (WWTPs) use natural biological processes to reduce the pollutants in wastewater to acceptable levels before discharge to surface and/or ground water. WWTPs range from small lagoons to large activated sludge facilities. **Key issues for WWTPs are: nutrient, hydraulic and organic loading.**

Many pollutants dumped into collection systems negatively impact WWTPs, either killing off the biomass or not being treatable and pass through to receiving waters or the solids portion of the plant.

Pollution prevention can keep pollutants from getting to the WWTPs. Pollution prevention identifies pollutants and educates about alternatives to simply putting bad stuff down the drain.

WWTP problems, community water-use practices and solutions follow:

- 1) Lagoons do not handle septage loads well, because the septage is concentrated and often has stuff that floats on top of the lagoon. **Septage should be taken to larger WWTPs.**
- 2) Infiltration and inflow in collection systems results in increased wastewater flows and decreased treatment time at WWTPs. **Improve, repair and maintain the collection system.**
- 3) Community water use patterns, like high usage and basement sumps, have a tremendous impact on the community WWTP. **Water conservation greatly improves WWTP treatment and capacity, saves money and protects the drinking water supply.**
- 4) Industry sources may have more and stronger quantities of pollutants and cause major impacts at WWTPs. **These significant sources of pollutants must meet community sewer use ordinance discharge limits. Pretreatment may be required.**
- 5) Homeowners overuse home, lawn and garden products, dump waste oil, use phosphate cleaning products, and dispose of toxic material into the collection system. **Community education efforts to STOP these activities, and to provide knowledge of WWTP processes help protect our environment.**

- 6) Slug loads of organic material byproducts from fruit, vegetable, milk and meat processing causes temporary upsets in treatment. **Food processors need systems to gradually send their high BOD food sources into the waste stream flow.**
- 7) Collection system activities can be coordinated with treatment plant processes for more effective wastewater treatment. Fuels and other materials dumped down the drain can be flushed to the WWTP. **Collection system personnel who understand the WWTP processes work to prevent limiting those treatment processes.**
- 8) Local light industries, like restaurants, motels, car washes, laundromats, dry cleaners and others exert smaller, yet significant influences on WWTPs. Oil and grease from failed grease traps are typical for restaurants; motels and laundries send detergents into the system; dry cleaners use products that pass through to receiving waters; and car washes often result in petroleum products in WWTPs. **These businesses should work with WWTP personnel to decrease amounts of material sent to wastewater facilities.**

It is absolutely necessary for the community to provide financial and governmental support for the WWTP. WWTPs need adequate funding for O&M, labor, physical facilities, repair and replacement, and emergencies. The WWTP must practice sound chemical use. Water use practices to preserve a good drinking water supply and to protect community waters are critical to pollution prevention. Government policies that prevent damaging discharges to the collection system must be developed. In this case, it's our own mess we are cleaning up; it's our own backyard; it can be expensive. Keeping our drinking water safe and our rivers, lakes and streams unpolluted is easier if we don't put pollutants in them in the first place.

SPEAKING OF POLLUTION PREVENTION...

...WE HAVE A NEW P2 SPECIALIST ON BOARD

...Welcome Mike Abrahamson!

Mike Abrahamson joined the Municipal Wastewater Assistance Program at the end of June, 1996. One of his main duties is to serve as the Pollution Prevention (P2) Coordinator for municipal wastewater facilities. Mike has a B.S. in Microbiology - Environmental Health option, and an M.S. in Environmental Engineering, both obtained at Montana State University, Bozeman. Upon graduation in November, 1995, he conducted research at the Center for Biofilm Engineering, located on the MSU campus in Bozeman. The research was directed toward designing and carrying out experiments on alternative on-site wastewater treatment systems. Mike is a Montana native who enjoys spending time with his family, camping, hunting, biking, and reading.

PRACTICAL BOOK BAILS OUT COMMUNITIES DEEP IN WATER AND WASTEWATER PROBLEMS

Water problems getting your community down? Well dry or contaminated? Septic systems failing? Outside funding for a solution dried up? You may find a way out in a new book from a non-profit that has spent the past twenty years helping small communities solve such problems--affordable: **The Self-Help Handbook For Small Town Water and Wastewater Projects**, published by the Small Towns Environment Program (STEP) of The Rensselaerville Institute, Rensselaerville, NY 12147.

"There is probably not a county in this country that doesn't have a community with water problems," says STEP director and The Handbook's co-author, Jane W. Schautz. "The state gets on the back of local officials to comply with health and environmental standards--but can't pay for a fix. Local residents watch their property values fall and health hazards rise--but see local taxes going out of sight if they pick up the tab. We offer a different--but proven--approach, one that costs less and builds local capacity."

The authors of **The Self-Help Handbook** share experience gained in actual projects in the nine states where the Small Towns Environment Program is active (AR, ID, MD, NY, NC, SD, TN, TX, WA). The book includes numerous case studies, drawings, diagrams, examples of forms, and other useful information, all in layman's terms.

The Self-Help Handbook is aimed at communities ready to pitch in and solve their problem starting with local resources. Arkansas State Representative, John Dawson, says in the preface that The Handbook "is for anybody who wants to help people make a tremendous impact on their own lives through improving their own community."

Not all communities are self-help candidates, so The Handbook offers guidelines for testing a community's self-help potential before launching into the specifics of how to apply self-help strategies. communities which pass the readiness test can look forward to lopping 30 to 70 percent or more from the cost of their water or wastewater project. New Jerusalem in Representative Dawson's Arkansas district did their waterline project for \$80,000 instead of the "retail" estimate of \$180,000.

Self-help strategies detailed in The Handbook start with taking advantage of local resources (e.g., choosing the simplest solution, involving local workers and volunteers, alternatives to buying equipment.) Always in user friendly terms, strategies also includes how to get free or reduce-cost legal, engineering and financial help and specific guidelines for what to do before construction (e.g., getting an engineering plan, learning the regulations, preparing a construction schedule). The Handbook also covers calculating the monthly bill to homeowners for construction and eventual operation of a water or wastewater project.

STEP is supported by the United States Environmental Protection Agency (USEPA) and the Ford Foundation. The Handbook was underwritten by USEPA. **The Self-Help Handbook** by Jane W. Schautz and Christopher M. Conway (300 pp., \$21.95 + \$3.00 S&H) is available from the Rensselaerville Institute, Rensselaerville, NY 12147 (518/797-3783, FAX 518/797-5270).

A PARTING THOUGHT

by Loren Bahls

Aldo Leopold once said that those who are trained in ecology are destined to live alone in a world of wounds. I share this observation with you because it may help you to understand my point of view. After nine years of formal education in aquatic ecology and 25 years of monitoring the health of Montana's lakes and streams, I must conclude that our state's aquatic ecosystems are in bad shape, and they're getting worse. This is not necessarily the view of a pessimist nor is it politically correct; but it is the honest view of a trained ecologist with 25 years of experience.

Whirling disease. Algae blooms. Dissolved oxygen deficits. Declining fish populations. Endangered and exotic aquatic species. Boil orders. Giardiasis and other intestinal ailments of unknown origin. Such topics are in the news with alarming regularity. We tend to treat these as isolated events but they are, in truth, symptoms of a general decline in our aquatic ecosystems. Ecologists have known for years that each species has special habitat needs and that all living things are interconnected. There is a common thread here if we look deep enough.

An aquatic ecosystem may be thought of as a three-legged stool. Each leg represents a key component of a waterbody's ecological integrity: (1) water and sediment quality (chemical integrity); (2) habitat, including water availability (physical integrity); and (3) a diverse, adaptive, and functional community of aquatic organisms (biological integrity). Together, the three legs support a platform--the seat of the stool--that provides the goods and services that people expect from our water resources, including fish, recreation, and clean drinking water.

Healthy ecosystems work best at providing these goods and services. All three legs--chemical integrity, physical integrity (habitat), and biological integrity--are required to support a healthy and optimally functioning ecosystem. Remove or damage any one leg, and the system will dysfunction or collapse.

The traditional approach to water quality management has been to control pathogens, toxics and other substances in water that are harmful to human health. However, as water pollution control efforts have reduced the levels of toxic pollutants, other factors often emerge that limit the integrity of aquatic ecosystems. These factors include bank erosion and sedimentation, dewatering for irrigation and domestic supplies, water level and flow fluctuations and thermal changes caused by the operation of dams, introduction of exotic species, nutrient enrichment and eutrophication, and habitat alteration, including encroachment into riparian areas and channelization of rivers and streams.

These factors may have enormous effects on the biota living in surface waters and meeting chemical criteria alone does not protect the biological community from these sorts of impacts.

While the narrow focus on chemical and microbiological water quality has successfully averted serious and widespread public health problems, it has not stalled the steep decline in the ecological integrity of our water resources. The signs of this decline are commonplace in Montana river systems. Populations of bull trout, cutthroat trout, white sturgeon, and other sensitive aquatic species, are declining. Whirling disease, which attacks non-native fish the hardest and is caused by a protozoan parasite whose intermediate host is a pollution-tolerant worm, has spread to several drainages in western Montana. Heavy growths of attached algae choke many of our streams, and blooms of toxic algae are common in our mainstem reservoirs.

In 1994, the State of Montana reported over 14,000 miles of streams and half a million acres of lakes that did not meet water quality standards (305b Report). The large majority of these lakes and streams are impaired by causes for which there are no numeric limits in the Montana Numeric Water Quality Standards (Circular WQB-7). These causes include nutrients, sediment, mineral salts, flow alterations (primarily from dams and irrigation dewatering), and damage to aquatic and riparian habitats. The effects on aquatic life of habitat alteration, flow regulation, nutrient overenrichment, and the introduction of nonindigenous species, have not been addressed within EPA's or Montana's more traditional water quality criteria and standards programs. For the sake of our lakes and streams, it's about time they are.

Granted, much of this damage was done before we had effective water quality laws and before we really understood the ecological implications of development--of building large dams, for example. But much of it continues today, more slowly perhaps, despite the best efforts of regulators. One reason is our narrow view of water quality, as explained above. But there are other reasons.

Regulators rarely take into account the cumulative effects of activities in a watershed. Activities are permitted (if they are permitted) in isolation of other activities. Even activities that individually have a "deminimus" effect on water quality will have a measurable impact if considered together. "You can BMP a watershed to death", as the saying goes.

In all fairness, regulators are often constrained legally in controlling water pollution. There are the very real issues of "takings" and property rights. As a result, the regulatory focus is on accommodating development by applying legally-supported environmental safeguards rather than on protecting ecosystems. And even if regulators were not so constrained legally, they still face some very real scientific limitations in being able to predict the environmental consequences of development.

If I have learned one thing in my 25 years in state government it is this: We cannot continue to have growth and development in Montana and have a quality environment--for ourselves, for fish and aquatic life, and for future generations of people. The two are not compatible, despite the most sincere political assurances, despite the most sophisticated technologies, and despite the most elaborate (and expensive) management schemes.

The lands that people harvest, the waterfront properties that people occupy, and the waters into which people dump their wastes are all habitats for some other species. Everything is hitched together. Every increment will be felt. We get food and lumber and electricity and living space. They get what's left. Our gain is their loss. And ultimately, their loss will be our loss too.



HELP WANTED

The Joint MSAWWA/MSWEF Committee for Safety and Heroism Co-Chairs are seeking information for nomination for one or more of these awards. The safety award can be made to systems which have recently initiated a safety program for their utility or deigned a piece of equipment which makes a particular task safer for the person performing such a task. If you know of anyone who has made an outstanding contribution to safety or has performed heroically in the line of duty please contact either Rick Cottingham or Tom Slovarp at 444-4549 or write to 1520 E. Sixth Ave., PO Box 200901, Helena, MT 59620-0901.

Rare and Exciting Water Stories!

by Rick Cottingham

One morning in the late August of 1995 my phone rang at DEQ and an elderly lady explained that she was experiencing problems with her well which she hadn't encountered in the 70 years she had lived on this island in Park County.

She stated that she was 87 years old and "had a musky odor like dirty socks and her clothes came out gray after washing". She asked "what might be the cause of all of this". I asked her if she had checked her well house recently or taken a bacti sample. She replied that "I haven't done either for a couple of years. We have never experienced many unsatisfactory water problems in all these years, but I'll check the well and call you back".

I gave her my number and she hung up. About an hour later she called again, this time a bit more excited.

This time she said "When I opened the unlocked lid to the well house I saw more than 200 mice scurry down the pipe through the well cap into my well. What do I do now?"

I told her, "First off, don't drink the water, don't bath in it, or prepare any food." Then I referred her to the Park County Sanitarian for remediation of the well. Generally when a contamination of this magnitude is experienced a well driller is called in to clean out the well and redevelop it. Then disinfection can be done and the well and casing thoroughly flushed.

Check your well on a regular basis and keep the well house secure from contamination or vandalism. A sanitary seal can help avoid all sorts of contamination, but it must be securely in place to do its intended duty.

WELL, WELL, WELL

WHAT SHOULD I KNOW ABOUT MY WELL ?

By Darrell McNenny, DEQ Contractor

As a contractor for the DEQ Drinking Water Program doing sanitary surveys and trouble shooting on small systems; I have the opportunity to see many kinds of sources, treatment facilities, storage reservoirs, distribution systems, and operation and maintenance programs. In this issue, we will discuss wells, and some of the concerns that you as an owner or operator of a small system with a well source should look for.

Well Logs

The short answer to the question posed in the title of this article is "everything I can find out", and the place to start is with the well log. When a driller drills a well, he or she is required by the Montana Department of Natural Resources and Conservation (MDNRC) to complete Form 603 - Well Log Report which they are required to file with the appropriate Montana Water Resources Regional Office (MWRRO) within 60 days of completion of the well.. There is also a copy of the well log that is to be given to the well owner that has a Form 602 - Notice of Completion of Groundwater Development on the reverse side that is to be given to the owner to complete and also send to the appropriate MWRRO within 60 days after appropriation of water for a beneficial use. A third copy is to go to the owner for their file, and a fourth copy is retained by the driller.

In addition to routine address and well location information, this "well log" describes each soil type encountered at various well depths, depth(s) that water was encountered, and overall depth of the well. It also lists construction details such as casing type and size, perforation type and depth, screens used, grout and sealing methods, etc. Careful study will also reveal static water level, test pump rates and drawdown, and other pertinent information about the well that every owner should want to know. Interpretation of the well log will help to determine whether the well is in a confined or unconfined aquifer, what the maximum pumping rate of the well should be, and many other pertinent factors. In short, you really can't survive without your well log (even though you may never have had one for as long as you have owned the system). So, if you don't have a copy of the well log in your permanent water system file, how do you find a copy? The quick way is to contact the well driller if you know who this is. The next stop would be with your local MWRRO (look under State Government - Natural Resources and Conservation - MWRRO in your phone book). As a last resort, try the Montana Bureau of Mines and Geology in Butte at 496-4336. If all else fails, at least have your local pump installer probe the well for static water table and depth of well the next time your pump is replaced.

So, while knowledge obtained during the drilling of your well is very important, it doesn't end there. You should also be aware of some of the construction and operational problems that can occur after the well has been drilled. Following are some of the more frequent problems that I observe when surveying small systems.

Yard Hydrants Installed In Well Caps

Some drillers and/or pump installers are installing self draining yard hydrants through split seal well caps directly into the wellhead. This is usually accomplished by first drilling a hole in the pitless adaptor, and then installing the yard hydrant directly into the adaptor. The problem with this is that every time the hydrant is used, and then closed, the barrel of the hydrant not only drains into the well; but every mud puddle, duck pond, bucket of solvent, or any other reservoir at the end of a hose, will also siphon back down the well. This type of installation is a direct cross-connection between the well and every connected hose, and should never be installed on any public or private system.

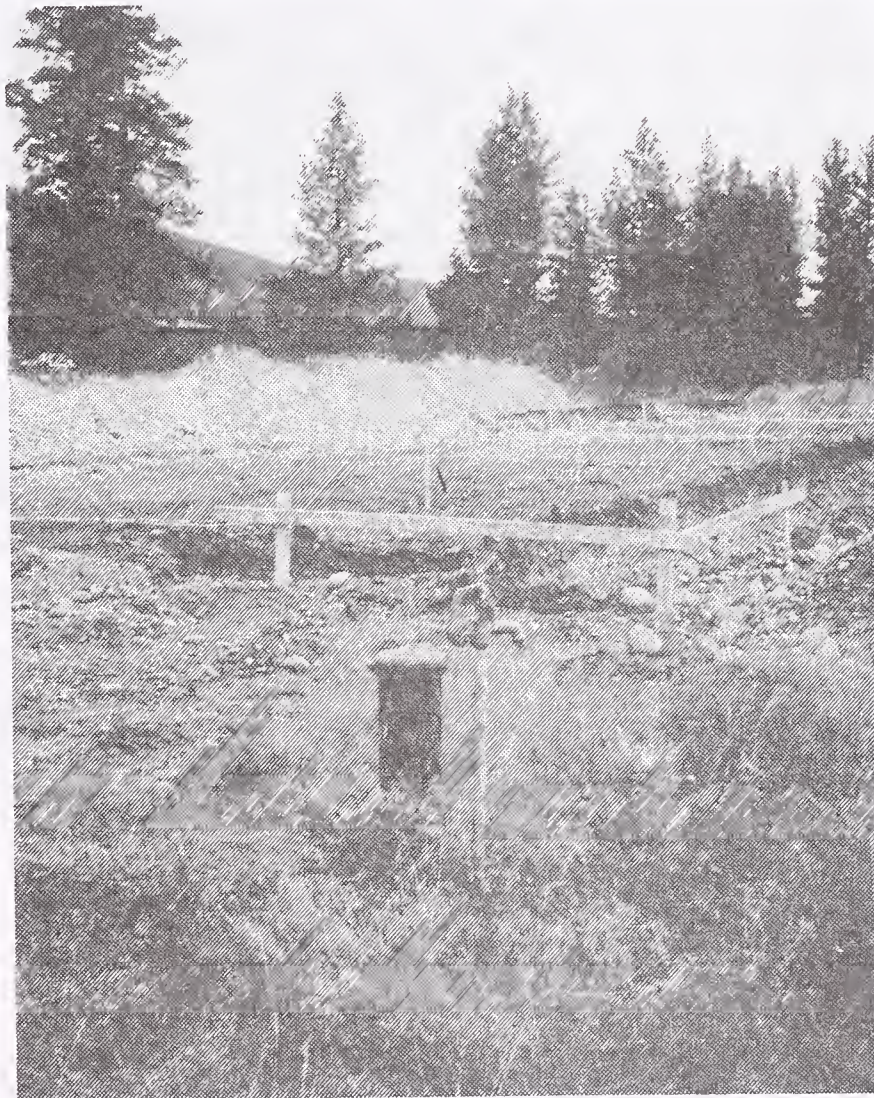
If you have one of these installations, promise yourself right now that you will never again attach a hose to that hydrant. If you cannot make that promise, the problem can be temporarily corrected with a Hose Bibb Vacuum Breaker (HBVB) of the type that will permit manual draining after each cold weather use. However, that should not be considered a permanent solution since sooner or later someone will forget to release the HBVB drain, and the barrel of the hydrant will freeze and break. The long term solution is to remove the yard hydrant, replace the portion of the pitless adaptor in the well that has the hole drilled in it (or at least plug the hole by inserting a capped section of pipe in the adaptor), and replace the split seal well cap with a conventional full cover cap. It is not satisfactory to just remove the yard hydrant from the pitless adaptor since water will continuously flow from the hole back into the well, and will in fact drain the system back down the well each time the pump stops.



Self-Draining Yard Hydrants Next to Wellheads

A related problem is the installation of self draining yard hydrants next to wellheads. State standard well specifications used to require a hydrant to be placed within 6 feet of the well on new installations. This standard provided a hydrant to discharge chlorinated water to waste if the well had to be disinfected, and was also considered an emergency source sample tap. More often than not, these hydrants were placed next to the well casing for ease of installation. The problem here is that if that hydrant is used without a hose, the water is going to pond around the well, and eventually pipe down the casing and contaminate the well. Also, every time the hydrant is used, the hydrant barrel drains at a location 6 feet underground next to the casing. As described above, there is also a potential to back siphon dirty water or other contaminants through a hose during the hydrant drain that one would never purposefully dump around a well casing.

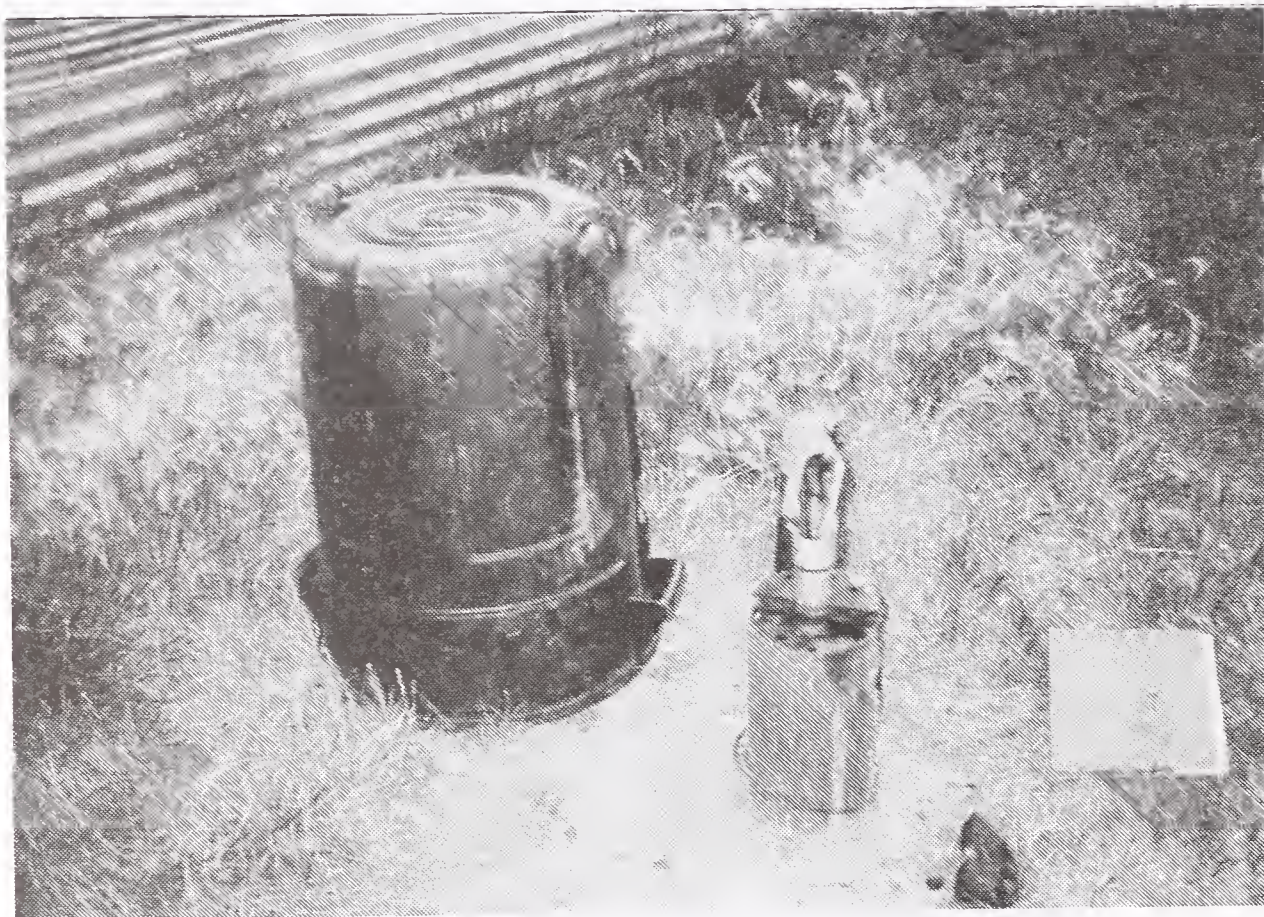
Since many of these hydrants have been installed next to the wellhead, the State has decided to make it mandatory that hydrants be installed at least 20 or 30 feet from the wellhead. Although they will still require that hydrants be installed on most small systems, they have indicated that they may approve an alternative hose bibb located on the inlet line in a pump house. If you currently have a hydrant located next to your wellhead, the State is not going to require that you immediately move it down line 20 or 30 feet. However, if you do find that you need to excavate around the well at some time, you might consider removing and/or moving the hydrant. In the meantime, follow the good practice of never allowing water to run or pond around your well, and keep a lock on these hydrants at all times.

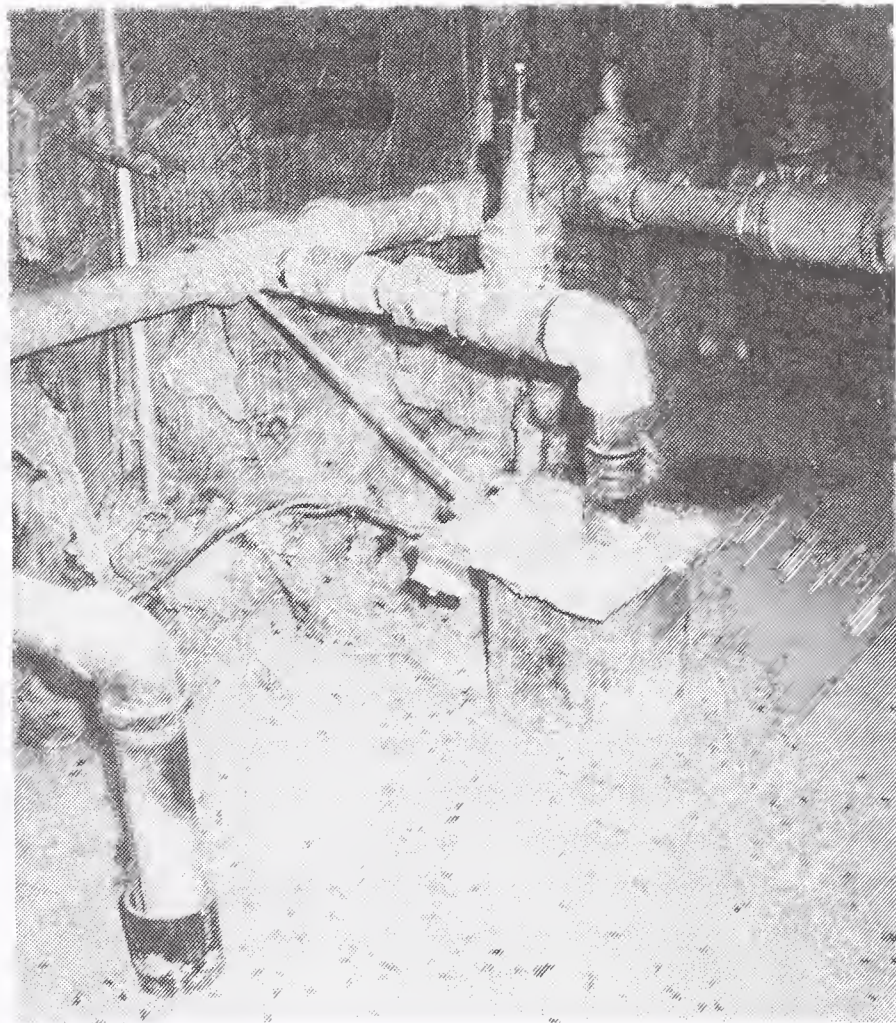


Split Seal Well Caps

I have observed many split seal well caps used outdoors on wells. This type of cap may be entirely appropriate indoors where they are not subject to rain, snow, and bird droppings that can be washed into the well, but they are not very acceptable for use outdoors. Granted that these caps have gaskets that are relatively tight if properly installed. The problem is that owners and operators often open these caps to disinfect their well or to do something else, and then do not adequately tighten the cap bolts again. I can often insert a knife blade between the split seal, and I also often find that some of the plug openings are left open.

So, if you have one of these types of well caps, either indoors or outdoors, inspect it carefully to be sure that it is secure and tight, and plug any open holes. If you must remove the well cap for any reason, be sure to securely replace it, and tighten all bolts. A bead of silicon calk along the split seal, and around protruding pipes or wires will also help. If this type of cap is outdoors, it would be a good idea to eventually replace it with a full cover cap.





Security and Pull Ropes

Another problem often observed is the security rope that is used by many drillers to tie off submersible pumps that are hung on polyethylene plastic drop pipes. An assortment of rope material is used for this purpose, but the one thing they have in common is that they need to snake out of the well somehow so they can be tied off. This is often through a split seal cap, and there is almost always an opening to the well where the rope emerges from the cap. In fact, it is often the rope that results in the cap not being properly sealed in the first place. This occurs both indoors and outdoors. A side issue here is that many of these ropes are useless since a few years of weather, well, and /or sun exposure deteriorate them to the point that they fray into a mass of fibers that are then released into the well water. I can't say that all rope types fall into this category, but I have certainly observed some that do.

While I sympathize with the rationale that says that a pump on a plastic drop pipe needs the protection of a security rope, some drillers and pump installers feel this is just not necessary for most installations up to 100 feet or so, especially if they are installed with some type of torque protection for pump start. Many small pump installations can easily be supported by properly sized and installed power cable. Larger and deeper pump installations should probably not be installed on plastic drop pipes in the first place.

So, if you have a pump installation with a security rope, check to be sure that it is not the cause of the well cap to be poorly fitted on the well. Secure as needed, and also use silicon to caulk around the rope or other locations that are open to the well. In the longer term, consider replacement of the plastic drop pipe with steel pipe where practical. If polyethylene plastic pipe is necessary due to well location in a basement or some other restricted area, question your pump installer as to whether a rope really is needed. For larger pumps and deeper installations where some security is needed, stainless steel cable is probably the appropriate solution.

Well Vents

On the one hand, we encourage you to plug up all holes in your well caps, and now we suggest that you should have a well vent. When your well pump runs, the water level in the well drops. As the water level drops, air has to enter the well or the casing would collapse, and this has happened in a few rare instances. If air cannot enter through some opening in the top of the well, there is a tendency to try to pull air, and perhaps contaminants, from outside the well casing. In short, well vents are necessary to maintain atmospheric pressure in the casing to prevent suction of contaminated water into the well.

Very small pump installations that result in little drawdown of the water in the well probably get adequate air from around the cap and/or through the power cable conduit. However, any well that typically has a water level drawdown of several feet or more during each pump cycle should be equipped with a vent that extends above the top of the casing, and is a screened return bend facing downward. Small system vents are often installed directly in the well cap, and some larger well vents are welded into the side of the exposed casing. Drawdown associated with various pumping rates can sometimes be determined from the well log.

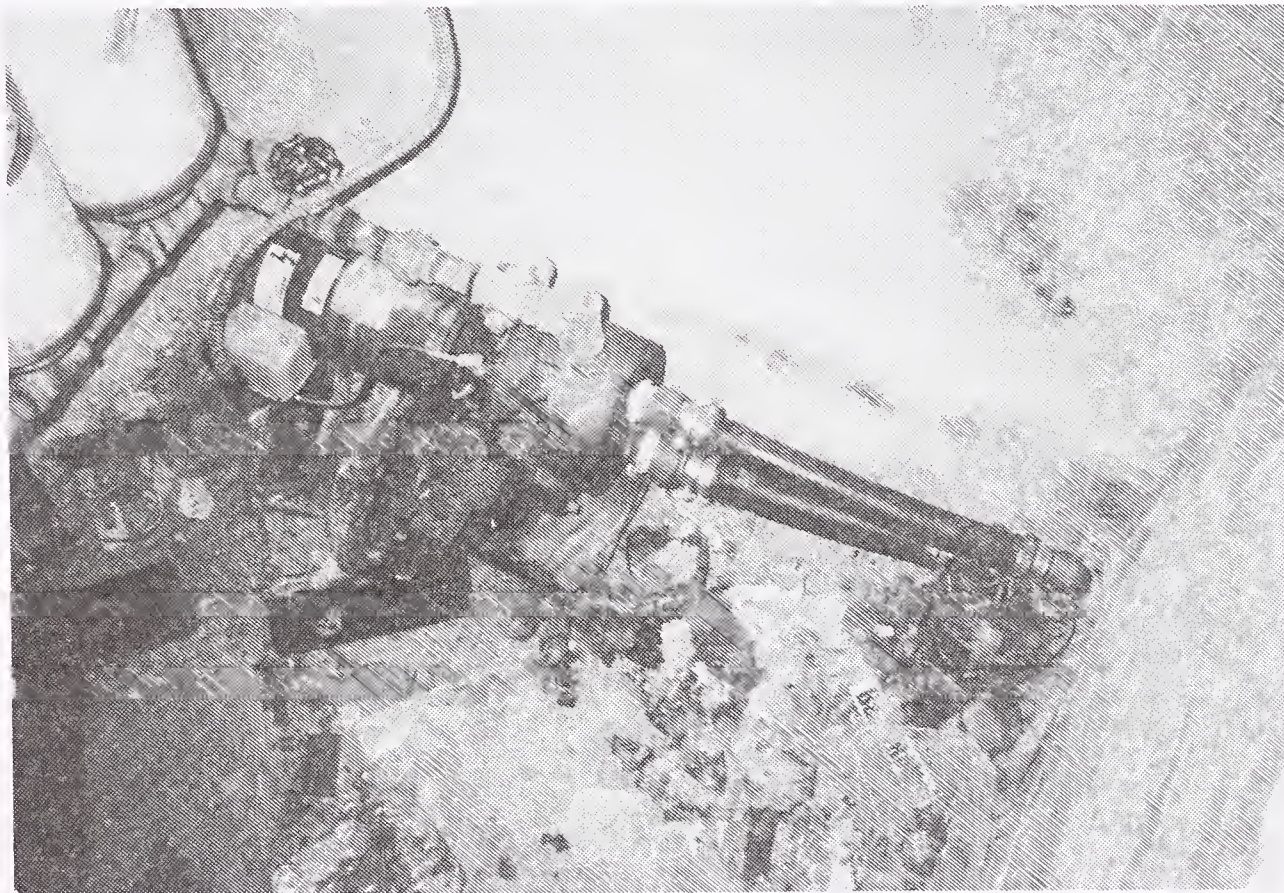


PROPERLY VENTED WELL CAP

Well Pits

Although the State strongly discourages the construction of well pits, I still find a few new well and/or pressure tank installations in pits, and of course I find many old installations of this nature that were installed prior to the development and use of pitless adaptors. These pits can and do occasionally flood from ground water, surface water, and leaks. However, and perhaps even more important, these pits and the equipment in them are seldom inspected. Maybe this is good since they are often physically unsafe to enter, and are probably also confined spaces without an entry permit. The tops and covers for some of these pits are also deteriorated to the point that they represent a safety hazard for unsuspecting children and animals.

If you are so unfortunate as to own a system with a well and/or pressure tanks in a pit, it is possible to correct the situation. The solution is to weld a length of casing to the existing well casing to extend the casing at least 18 inches above ground level. Install an appropriate well cap and pitless adaptor unit, and tie in to the existing service line. If the pressure tank is also located in the pit, it can often be moved down line into the basement or a utility room of the first building on the system. A bit of electrical and control cable work, and you are back in business. The old pit should be back filled to just a little above natural grade level so that water will drain away from the extended well casing. Of course, an alternate solution to moving the pressure tank inside an existing building is to construct a well house around or near the wellhead to house the pressure tank(s) and the pump if it is not a submersible.



Well, well, well, hopefully you now understand more about your well, and recognize some of the common deficiencies associated with wells that can cause water systems problems.

Operator Code of Ethics

by Rick Cottingham

As you may have read in the last issue, there were questions as to why other states have a "Code of Ethics" for water and wastewater operators. Operators and Managers wanted to know why Montana had never adopted such a code. With a "Code of Ethics" they would understand the necessity to possess the knowledge and technical skills needed to perform their duties and protect the inventory and investment of the communities.

So I outlined what I felt constituted a responsible operator. Our "Code of Ethics" follows.

My friend Lee Michalsky, Midwest Assistance Program, was my lone critic. Lee suggested moving "to protect the public health" to the top of the list. He pointed out that that's what operators should be dedicated to in our professional endeavors. Good job, Lee! He also said something about a "tattoo" or a "pledge of ethics" for mandatory recital, but Shirley put the kibosh on that.

We presented this to the Certification Council on May 9th in Helena and they voted to have this added to the Application Form for operator certification. Future applicants will now know most of the requirements that go along with being an operator, such as: long hours, low pay, broad shoulders, ability to make a dime stretch into a dollar, lawyer, engineer, microbiologist, chemist,

plumber, mechanic, electrician, and above all possess a good sense of humor.

Montana Operator Code of Ethics

Using my best judgement and operating skills, I will always work, to protect the public health, to ensure good service, to protect public property and the environment, by applying my skills in operating water and wastewater system equipment, by properly and accurately completing required records, following and complying with state and federal rules and regulations, continuing my education in my field, and working with management to establish distinct and safe operating policies for the public utilities for which I am entrusted.

Then of course there's the secret handshake, too. But that's yet another article.



WATER AND WASTEWATER OPERATOR CERTIFICATION NEWS

by Shirley Quick, Certification Officer, DEQ

New CEC Biennium is Starting!

Congratulations to all of you who earned your Continuing Education Credits (CECs) by June 30, 1996! Those of you who had forgotten that this June was the end of the CEC two-year period were probably reminded by a personal phone call from **Rick Cottingham, Bill Bahr or Terry Campbell** of the WQD staff. Thanks to Rick, Bill and Terry, a lot of operators were saved from having to retake their certification exams.

Those of you who **didn't make the deadline should contact the certification office** (406/444-2691) to reapply to take the certification exams this fall (see exam notice following this article).

It is never too early to start shopping for your CEC training courses for the new CEC period (REMINDER: it runs from July 1, 1996 to June 30, 1998). Check your METC training calendar, watch the mail for training brochures, or give the certification office a call to find a class in your area.

Becoming Fully Certified is Your Responsibility

If you were classified as an Operator-in-Training (OT) when you initially became certified, it is your responsibility to inform the certification office when your experience requirements have been met. You can become fully certified by following these easy steps:

1) Find the **experience voucher** that was sent to you with your OT certificate. (If you have misplaced your copy, call the certification office and request another copy be mailed to you.)

2) Find the section on the voucher that states "Verify _____ months full-time operating experience in a Class _____ system since _____." If you have worked full-time for at least the number of months specified, in the class system specified, and since the date specified, you have met your experience requirement.

Remember that the experience required on the voucher starts on the **day following the date of your application** for certification.

3) Fill in the system name, dates, and sign the experience voucher. Then have this information verified by your employer.

4) Mail the completed experience voucher and all fully certified and OT certificates to the certification office.

5) If the information on the experience voucher coincides with the requirements and records of the certification office, you should **receive your new fully certified certificate within 2 to 3 weeks**. You will be contacted if there is a problem.

6) If you are working summers in a co-op situation, please remember to have experience vouchers verified for those months. No time is too short to turn in when working towards full certification.

☛ QUICK REMINDERS ☛

The next exam for all classes of exam will be Friday, September 27, 1996 in Bozeman. The deadline to sign-up for the Fall exam is September 12, 1996. Contact the certification office (444-2691) to request an application.

No CECs will be granted for the fall water school basic track of training since they are designed for applicants for exams, not certified operators.

You don't have to attend Water School to take the exam in Bozeman on September 27. Although a basic track of training will be available at the school for new applicants, it is not mandatory to attend.

Applicants for Class 4 & 5 can take their exams in any of the DEQ offices in Helena, Polson or Billings. You **MUST** set up an appointment at least one week in advance with both the certification office and the regional office.

Montana law states that the designated person responsible for contact and communication with the Department including monitoring and sampling must be a fully certified operator.

Contact Shirley Quick at the certification office if you have any questions 406/444-2691

How the Renewal Process Works

June 30, 1996 has come and gone and another renewal period has come to an end. This year was especially exciting at the certification office since it was also the end of the Continuing Education Credit (CEC) training biennium. During renewal process, a lot of phone calls came in from people who had good questions about the renewal process. The following are a few of the questions with the answers which may clear up some of your questions:

"Do I need to pay the renewal fee by June 30 if I just took my exam in March of this year?" Yes. The \$30 fee you paid with your application to take the exam was the annual application fee. Everyone who passes the exam, either in the fall or spring, must pay the renewal fee for the next state fiscal year (June 30 to July 1).

"What time period does the CEC biennium cover?" The two year period from July 1 of an even numbered year to June 30 of the next even numbered year. For example, the next CEC biennium is from June 30, 1996 to July 1, 1998.

"How do I find out if I have met my CEC requirements?" Every year in January or February, you will receive a CEC status report which shows the CECs that have been reported to the certification office for you. Please check this report carefully to be sure that all classes you have attended are on this sheet. If they aren't, call the certification office immediately.

"If I don't meet my CEC requirements by the end of the biennium, what happens to my certification?" The rules state: "The certificates of operators not fulfilling the credit requirements shall expire on June 30 of the applicable biennium and may only be reissued on passage of the appropriate exam(s)." In other words, you have two years to earn your CECs and if you don't, start studying to take the exam again.

"Why is it necessary for me to send back that invoice with my renewal fee?" The DEQ receives thousands of dollars a day in payments for a variety of programs. Most checks go directly to the

business office, not to the program the money is for. The renewal invoice has all the proper coding on it to tell the business office who to credit the money to.

"If I don't pay my renewal fee by June 30, what happens to my certification?" If you pay after June 30, add an additional \$10 to cover the late fee. If your payment is not postmarked by June 30, your certificate is suspended. If your certificate is suspended for over 30 days, you will be notified of our intention to revoke your certificate by certified mail. Ten days after you have been notified your certificate will be revoked and you will have to retake the exam.

"My invoice got mailed to my house instead of the billing office at work and I lost it. Why didn't you send it to the billing office instead?" When you initially fill out your application, we put the address you have given us into the certified operator

database. If the address you have chosen is your home address, that is where all of your mail from the certification office and for training from METC will be mailed. REMINDER: Be sure to keep the certification office notified of any change of address, no matter how temporary.

"When do I receive notice that I have met my renewal requirements?" During the first two weeks of July you will receive a wallet card and water drop in the mail along with an informational letter. If you have not received your card or drop in the mail by mid-July, call the certification office to check on your status. NOTE: An official receipt will not be mailed to you unless you specifically request one.

"What am I supposed to do with the water drop when you send it to me?" As the informational letter that comes with your card and drop will tell you, affix the drop to your certificate under the appropriate year to show that your certification is in good standing. REMINDER: You are to prominently display your certificate in the office of the system you work for.

"What if I lost my certificate?" Send a letter with the \$10 duplicate certificate fee requesting another copy be mailed to you.



For more information, call Shirley Quick
at the certification office 406/444-2691

DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER QUALITY DIVISION

METCALF BUILDING
1520 EAST SIXTH AVENUE

MARC RACICOT, GOVERNOR



STATE OF MONTANA

(406)444-4549
FAX (406)444-1374

PO BOX 200901
HELENA, MONTANA 59620-0901

EXAMINATION NOTICE

FRIDAY -- SEPTEMBER 27, 1996 -- 8:30 A.M. TO 12:30 P.M.

Examinations have been scheduled on the above date for certification as operators for **Water Distribution Systems, Water Treatment Plants, Well Water Supply Systems, Wastewater Treatment Plants, and Wastewater Lagoons** at the following location:

**STRAND STUDENT UNION
MONTANA STATE UNIVERSITY - BOZEMAN**

Please contact the certification office for information on the Math Review that will be free for all pre-registered examinees in Bozeman on Thursday afternoon, September 26, 1996. The Water School being held on the MSU campus September 23-26 will include basic training for entry level operators. **Attendance at the Water School is not mandatory, but is recommended.** To request a brochure on the Water School call MSU at 406/994-4930. Fees for the school are payable to MSU with pre-registration.

BY SEPTEMBER 12, 1996 EVERYONE TAKING THESE EXAMINATIONS MUST HAVE:

- ☐ Completed and returned an application for certification as a water/wastewater operator.
- ☐ Paid the annual application fees for fiscal year 97 which runs from July 1, 1996 to June 30, 1997.
- ☐ Submitted an examination registration slip and fee of \$5 per examination. (Combination examinations 2A3B, 3A4B, 4AB and 5AB require \$5 examination fee only.)

APPLICATION FEES ARE: One \$30 fee for any water type and classification of exam; and one \$30 fee for any wastewater type and classification.

TO REGISTER FOR THIS EXAM: Detach and mail the registration slip below to the following Helena address. For additional information, call Shirley Quick at the Helena operator certification office at 406/444-2691 or write:

**WATER/WASTEWATER OPERATOR CERTIFICATION
Dept. of Env. Quality - Box 200901 - Helena 59620-0901**

PLEASE RETAIN THE UPPER PORTION OF THIS NOTICE



EXAMINATION REGISTRATION SLIP

(Mark which exam you will be taking, detach and return with the \$5 exam fee by September 12, 1996)

Type	Class	1	2	3	4	5
Water Distribution	A	_____	_____	_____	_____	_____
Water Plant	B	_____	_____	_____	_____	_____
Wastewater Plant	C	_____	_____	_____	_____	_____

NAME: _____ SYSTEM: _____

ADDRESS: _____



**PASSING EXAMINATIONS FOR
FULL CERTIFICATION OR
OPERATOR-IN-TRAINING (OT) - SPRING 1996**



<u>NAME</u>	<u>CITY</u>	<u>CLASS</u>	<u>NAME</u>	<u>CITY</u>	<u>CLASS</u>
BAKER, Dennis A.	E Glacier	1B	NIESKENS, Mike O.	Glasgow	1Bot
BALL, Walt M.	E Glacier	1B	O'LEARY, Earl Q.	Helena	1Aot
BRACE, Ed	Neihart	1Bot	POWERS, Mark	Butte	1A 1Bot
BRUNS, Robert L.	E Glacier	1B	REARDON, James T.	Havre	1Bot
BURKE, Tom F.	Billings	1Cot	REIFSCHNEIDER, Carol	Havre	1Cot
DURHAM, Jeffrey D.	Conrad	1Aot	ROACH, Mark C.	Billings	1Bot
EMERICK, Shaun	Billings	1C	SOLBERG, Brian	Havre	1Bot 1Cot
HANEWALD, Jack	Billings	1Bot	THATCHER, Gene	Butte	1A 1Bot
HESTER, Greg	Havre	1Aot 1Bot	THOMAS, George	Stevensville	1B
JOHNSON, Jimmy D.	Havre	1Bot 1Cot	TUERO, John	Missoula	1C
KELLY, Danny L.	Paradise	1Aot	VOSEN, J. Scott	Havre	1Cot
KUIPERS, James R.	Butte	1Cot 1Dot	WALDNER, George G.	Cut Bank	1Bot
MINNETI, Eric	Havre	1Bot 1Cot	WILLIAMS, Jason	Havre	1Bot 1Cot
AUGARE, Steve R.	E Glacier	2Bot	PARKE, Brad J.	Hamilton	2Cot
BUTCHER, Tom	Livingston	2A3B	PERRY, Mark A.	Babb	2B
DOMKE, Douglas	Livingston	2Cot	REED, Richard E.	Col Falls	2A3Bot 2Cot
FORD, Michael	Kalispell	2A3B	THOMAS, George	Stevensville	2A
HALPIN, Thomas C.	Big Sky	2A3B			
BARKLEY, Tim	Great Falls	3B	HADFIELD, Bill	Boulder	3A4Bot
BOOTH, Ralph W.	Hungry Horse	3A4B	JOHNSON, Dorothy M.	Circle	3A4B
BROWNE, Russell J.	Reedpoint	3Cot	KNIGHT, Rex Jr	Wibaux	3A4B
CASTEEL, David L.	Lakeside	3A4Bot	STORER, Steve	Columbus	3Cot
DAY, Donald L.	Libby	3C	WEIDOW, Clint	Pinesdale	3A4Bot
ACKERMAN, Dale	Great Falls	4A 4Bot	RANSOM, Marc E.	Missoula	4AB
AUGARE, Steve R.	E Glacier	4A	RASMUSSEN, Glen	Clancy	4ABot
BAKKER, Joseph L.	Kalispell	4Aot	REAVELY, Keal	Darby	4AB
BENNETT, William S.	Whitefish	4ABot	REED, Travis C.	Babb	4ABot
CRILL, Michael D.	Virg City	4AB	RIDDLE, John C.	Lame Deer	4AB
FLETCHER, Kelly	Great Falls	4A 4Bot	RIFFER, Michael	Great Falls	4A
GALLAGHER, Jeremy	Great Falls	4A 4Bot	SAVAGE, Steve	Missoula	4ABot
HILLER, Larry	Missoula	4ABot	SMITH, Logan	Twin Bridges	4ABot 4C
JEFFERSON, Mark	Great Falls	4A 4Bot	TAUSCHER, Tom	Hardin	4ABot
MURPHY, James S.	Froid	4ABot 4Cot	WALKER, J.B.	Floweree	4ABot 4Cot
PANKEY, Arthur R.	Libby	4ABot	WILKE, Jeffrey	Lakeside	4AB
RADLEY, James	Great Falls	4A 4Bot			
AVANTS, Wayne A.	Hamilton	5AB	KOMIS, Larry J.	Malta	5AB
BENEVENTI, Joseph B.	Jeff City	5AB	MCDONALD, Gary W.	Kalispell	5AB
CHENARD, Steve M.	Bigfork	5AB	RIDDLE, John C.	Lame Deer	5AB
DIX, Richard J.	Helena	5AB	ROBINSON, Robert	Helena	5AB
HEDEGAARD, Gary L.	Milltown	5AB	SKILLMAN, Edward F.	Livingston	5AB
HOFER, John	Galata	5AB	TILMANT, James	Kalispell	5AB
JOHNSON, Ronald R.	Terry	5AB	WALDNER, David	Valier	5AB

CONGRATULATIONS! To all of the above operators who passed their examinations in the spring of 1996. The examinations for certification require considerable time in study and preparation. Passing the examination represents a lot of hard work and initiative on the part of the individual. Be sure to show your appreciation to your water and wastewater operator for working hard to insure that he is properly trained to care for your system!

MATH REVIEW FOR CERTIFICATION EXAM

Sponsored by

DEPARTMENT OF ENVIRONMENTAL QUALITY

Thursday afternoon, September 26, 1996

1:00 - 4:30 pm

BOZEMAN

Montana State University
Strand Student Union Building

Presented by: DEQ Staff and Advisory Council Members

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This session is intended to review basic math for those people with valid applications for the exam being given on Friday, September 27. **You will never learn everything you need to know at a water school to pass the exam OR to be a competent operator.** The study materials we provide and suggest are designed for self study.

At the Water School in Bozeman, September 23-26, 1996 there will be a basic track of sessions available each day to answer questions you may have from your self study, and to give you an overview of information.

Since these sessions are designed for entry level operators, **no CECs will be given** for any of these sessions, either for the Thursday afternoon session or the basic track available at Water School.

For more information contact Shirley Quick, Water/Wastewater Certification Office, Permitting and Compliance Division, 444-2691.

MANAGEMENT AND SUPERVISION FOR WORKING PROFESSIONALS, I AND II

This internationally known management certification program, which has been used by many thousands of water and wastewater treatment plant operators is now available in a new 3rd edition. It was awarded the prestigious National University Continuing Education Meritorious Course Award.

Whether you are a manager, or soon will be, you need this down-to-earth management program, which is offered through correspondence. These courses teach over 200 management and supervision topics related to how to work with people. These textbooks clearly demonstrate practical procedures and techniques using case studies and situations most likely to occur in these areas. Each textbook is uniformly set up with nine chapters and each chapter is a self contained lesson including chapter outline, learning objectives, fundamental management information, practice exercises, self-testing questions, and case problems.

To obtain the textbooks, Management and Supervision for Working Professionals Vol. I and Vol. II, 3rd edition, Dr. Herman Koren, contact:

Lewis/CRC Press
2000 Corporate Blvd. NW
Boca Raton, FL 33431
1-800-272-7737
FAX: 1-800-374-3401
Internet: orders@crcpress.com

Cost: \$54.95 per textbook

To enroll in the management program through correspondence for CEU credit, contact:

Office of Independent Study
Indiana State University
Terre Haute, IN 47809
1-800-234-1639
FAX: 812-237-3495
Internet: asrwiers@ruby.indstate.edu

Cost: \$50.00 per course

APPROVED FOR 5.0 CONTINUING EDUCATION CREDITS

THE 1996 MISSOULA CONFERENCE:



◀ *The folks at the Conference who stuck it out until Friday lunch. (Note the nifty "Compost Happens" shirts modeled by MWEA Biosolids committee members Scott Anderson and Mike Jacobson.)*

The visiting dignitaries from AWWA and WEF receive fabulous gifts to try to carry onto the airplane home.



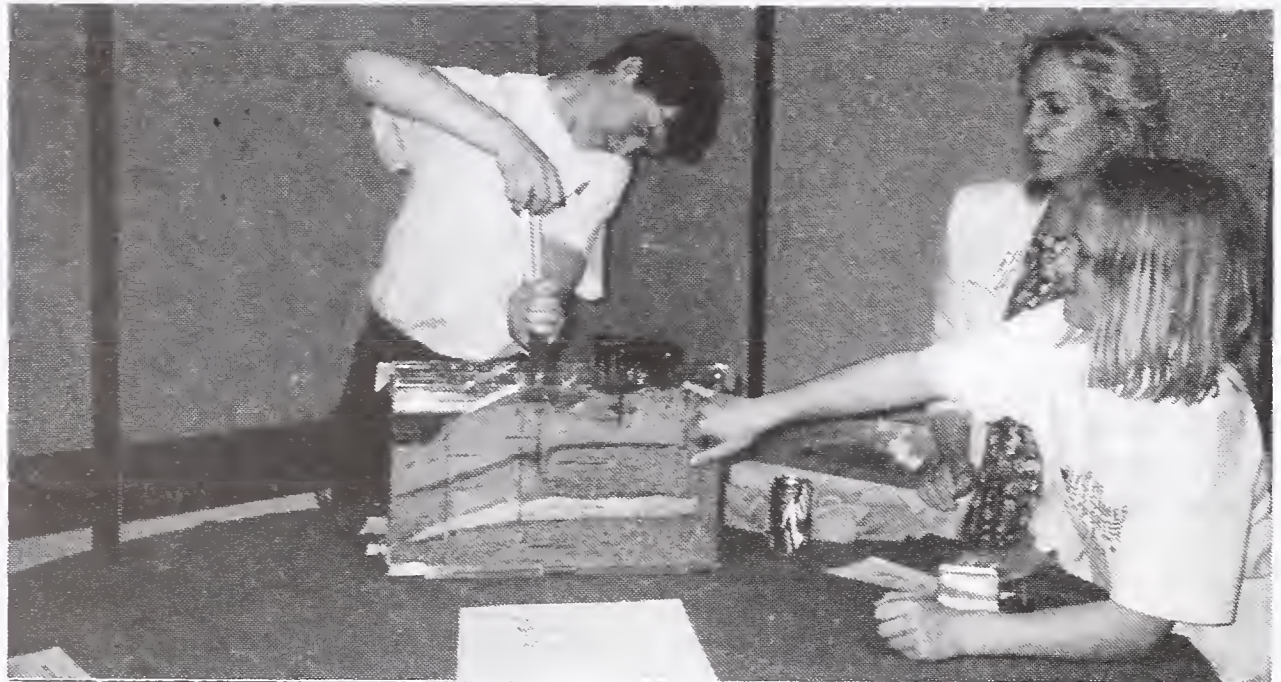
◀ *The vendor exhibition was the biggest and best ever. (My guess is, you know these folks.)*

EDUCATIONAL SEMINARS!



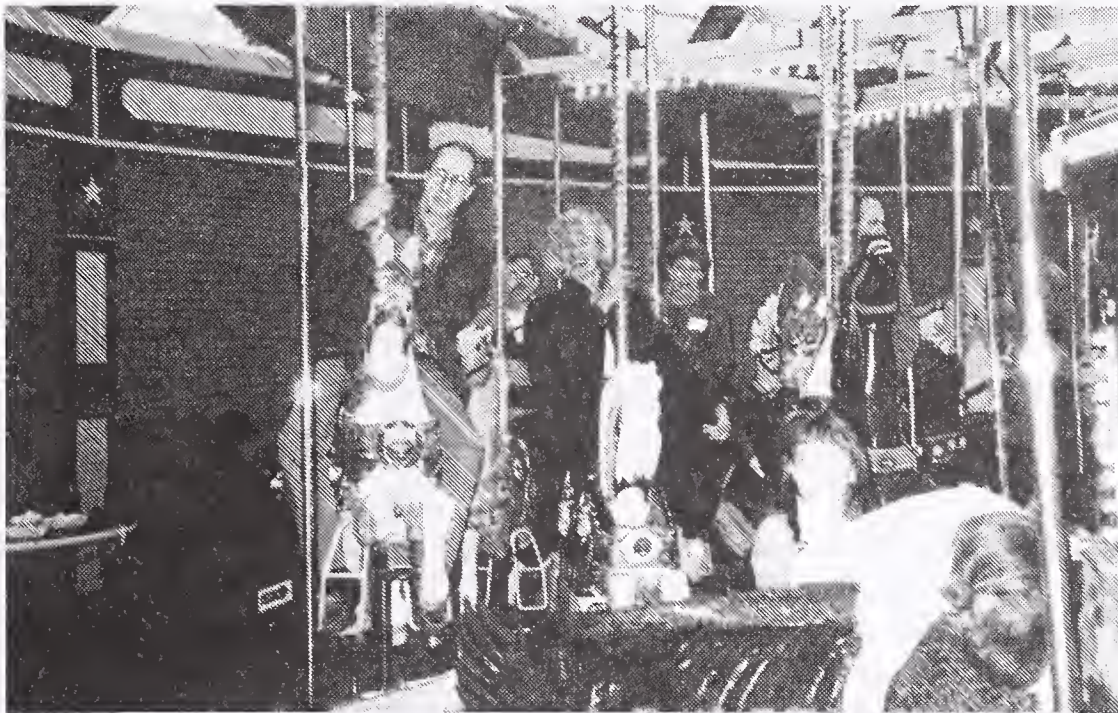
◀ Conference goes learn about new technologies, on-going research, and better ways of doing the job of water and wastewater treatment.

Missoula's Grade ▶ Schoolers show the rest of us about water, pollution, and making the right choices.



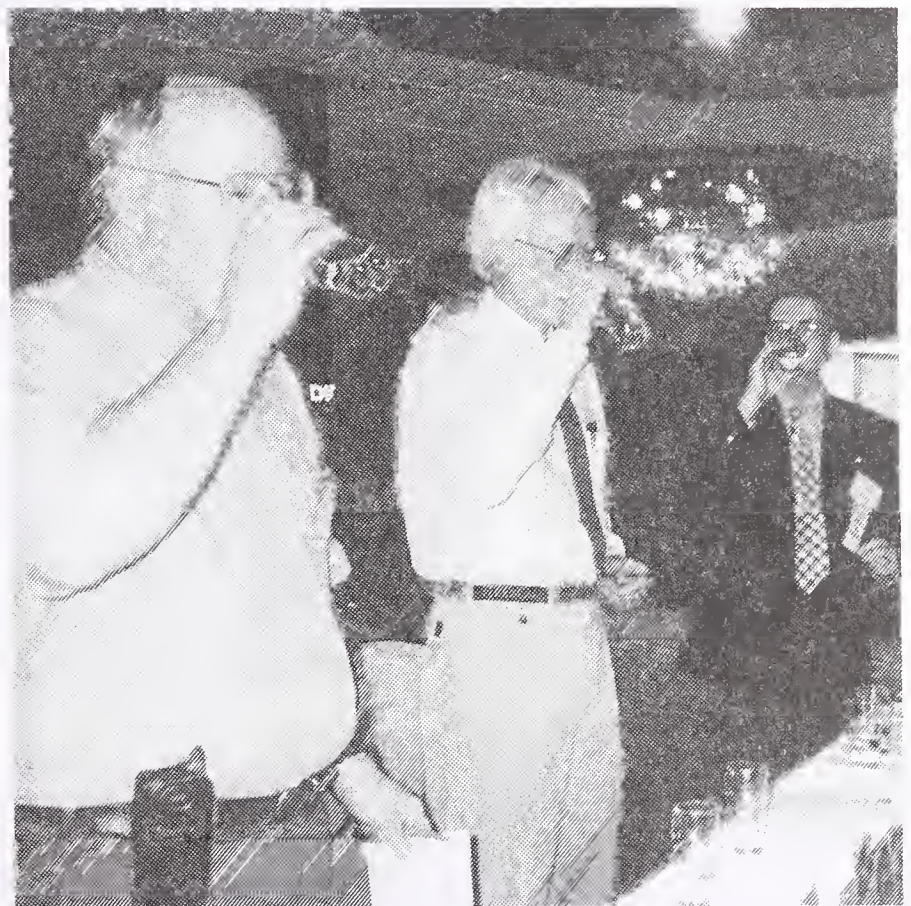
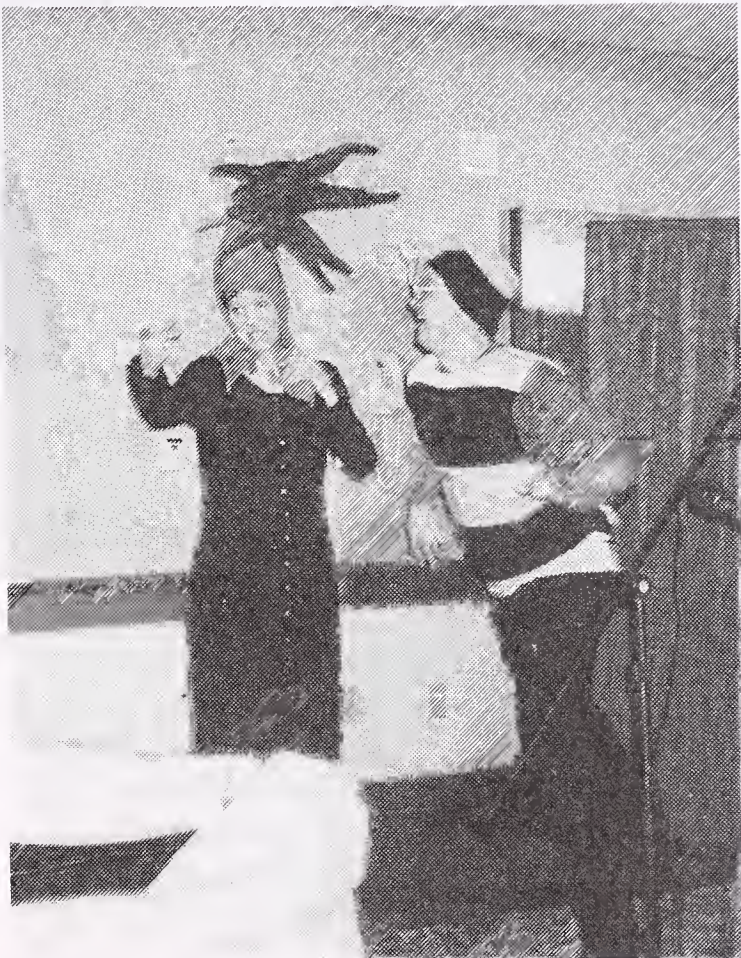
◀ Mr. Biosolids, Paul Montgomery, explains the subtle nuances of beneficial use of biosolids to any and all who would listen.

ENTERTAINMENT AND COMPETITION!!



◀ *The carousel was very well attended (and obviously enjoyed!)*

Kristi Kline is not sure what the crazy Killer Bee will think up next. (I think she's appealing for help.) ▼



▲ *Drinking water taste test won by the City of Billings. (Everybody else was at the wine-tasting event.)*

AWARDS, AWARDS, AWARDS!!!



◀ *Willis Wetstein is honored with a Lifetime Achievement Award from MSAWWA.*

Paul LaVigne is inducted into the Select Society of Sanitary Sludge Shovelers by Tim Hunter, Honary Conductor of the 5S Ceremony. (Paul Montgomery couldn't make it!) ▶



◀ *MWEA National Director, Bill Bahr announces Small System Wastewater Treatment Plan award to the Town of Whitehall.*

...AND MORE AWARDS!!

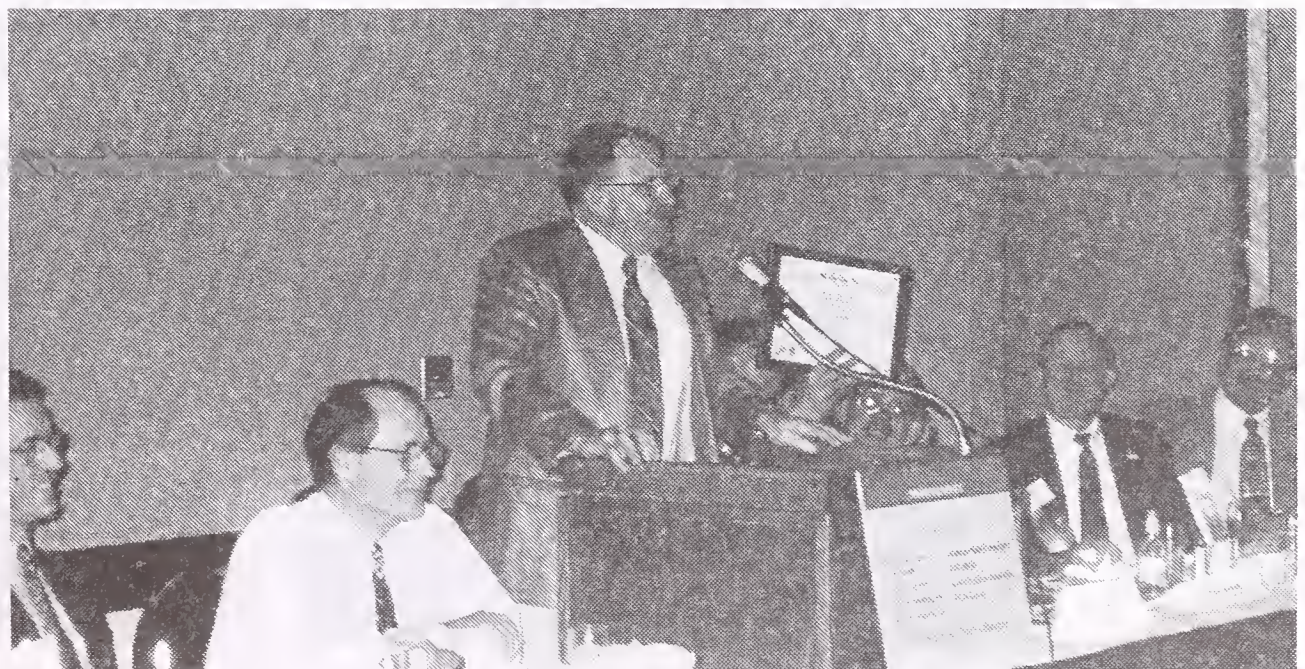
Paul LaVigne, MWEA Biosolids Committee Chair presents the First Annual Biosolids Award to Tom Thiel, Chairman of the Big Fork Water and Sewer District. ▼



▲ *WEF President, Dr. Richard Kuchenrither presents the Burke Safety Award to Boris Krizek, City of Billings Wastewater Treatment Plant.*

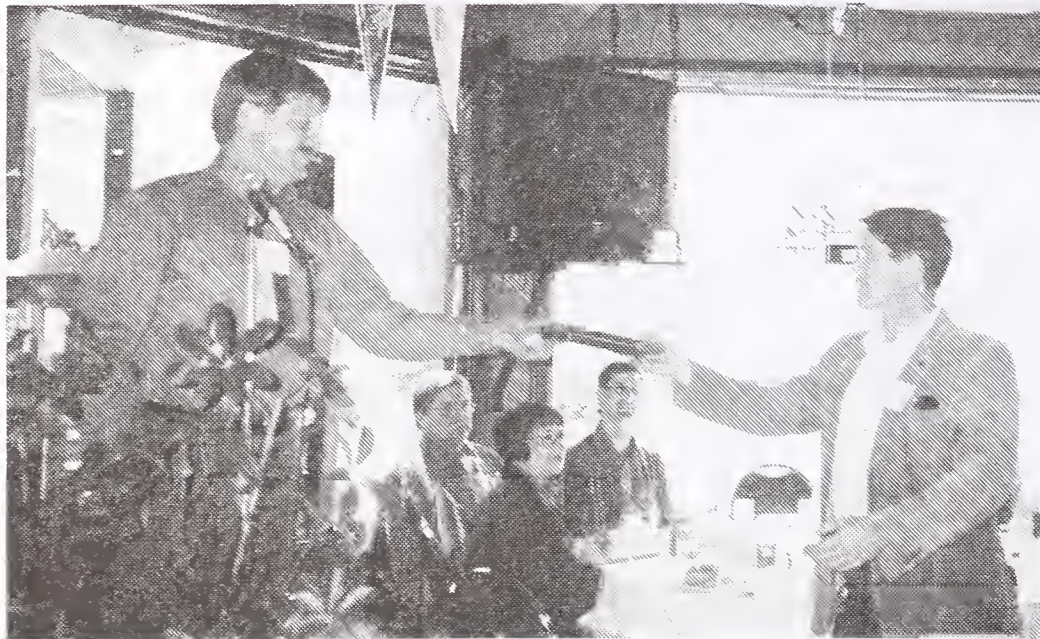


► *Henry Elbrecht announces the Small System Public Water Supply award to the Town of Devon who's Operator is Art Adamson.*



...AND EVEN MORE!!!!!!

AWWA Vice-President, Roderick Holme, presents the prestigious Fuller Award to Steve Ruhd, Public Works Director for the City of Conrad.



MWEA National Director, Bill Bahr, presents the Operator of the Year Award to the elusive David H. Haverfield, Manager of the Lolo Water and Sewer District.

A **SPECIAL** thanks to Tim Hunter, MWEA Host City Co-Chair, Mary Allen, Executive Director, and Bob Ward, MSAWWA Host City Co-Chair, for all the hard work. This was one of the most successful and enjoyable Annual Conferences ever.



MWEA DIRECTOR'S MESSAGE

Greetings to all the MWEA folks out there. I'm writing this really fast, so be sure to read slowly. (Old joke.) There are significant happenings in the world of WEF and MWEA. We are the host Member Association for the western regional MA meeting next May. I guess the rest of the states want to see what Montana looks like. Maybe we should change it to January, so they can get a taste of 'real' Montana. Seriously, it should be a great meeting. Quite a lot of information is exchanged at these meetings. Plus, the various western MAS get heard better by WEF about our concerns, like dues increases, member services, etc.

The new Professional Wastewater Operators Division for MWEA is Starr Sullivan. (You can see who the rest of the new officers are elsewhere in this CLEARWATER.) Starr is planning some activities to build the PWOD. We need to support him in these activities. Please call him at 523-4880, at the WWTP in Missoula. We would like to begin the process of a Montana Ops Challenge; maybe a regional concept. Also, I have suggested that PWOD head up the MWEA effort to begin a voluntary certification program for collection system operators. Please call if you'd like to comment or help.

We've been requested by WEF to build a Home Page. All you computer hacks know what I'm talking about. I think it would be a good idea, but it seems we need a central office to maintain it. Perhaps it's time to hire an executive secretary. At any rate, Mike Rubich, MWEA past president, is planning to put together the nuts and bolts of our first Home Page. Watch for it.

I'll have more news about WEF for you in the next CLEARWATER, after the conference. They are considering things like small, justifiable dues increases to meet their needs; not the large one like we just went through. PWOD and wastewater treatment issues are coming back into the programs even more, so WEF has gotten the message about who their main membership really is. Last, in the picture below, I was honored to be able to 'officially' present the Burke Safety award to the City of Billings during the regular city council meeting. Congratulations, again, Billings, for working safely!!



**MWEA BOARD OF DIRECTORS/EXECUTIVE COMMITTEE
1996/1997**

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SENIOR TRUSTEE

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PWOD DIRECTOR

Mr. Starr Sullivan
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406/523-4888 (fax 406/523-4880)

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1996/1997**

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1996-1997

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MONTANA SECTION AMERICAN WATER WORKS ASSOCIATION MONTANA WATER ENVIRONMENT ASSOCIATION

1997 JOINT CONFERENCE

CALL FOR PAPERS

The Program Committee has issued a Call-for-Papers to be presented at the 1997 Annual Conference, scheduled for May 7, 8 and 9, 1997 in West Yellowstone. The Conference's technical sessions will be developed from both submitted and solicited papers. Papers should be on a specific subject of interest to Montana's water, wastewater or solid waste-handling professionals. Suggested topics include pollution prevention and water conservation; corrosion control in water distribution systems; alternative treatment and disinfection processes; pilot studies for filtration; and biosolids management.

Presentations are typically 20 minutes in length, followed by 10 minutes for discussion and questions. Written papers may be provided to participants and can be more extensive and comprehensive than the 20 minute presentations.

Papers will be chosen from abstracts or ideas submitted on or before October 15, 1996. Please complete the submittal form included on the back of this sheet, and attach a copy of your abstract. Abstracts must be no longer than 500 words in length (two pages, double spaced) and should include the speaker's name.

If you are not interested in giving a paper, but have burning issues you'd like addressed, please contact a Program Committee Member listed below with your suggestions.

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Shelley Nolan, Co-Chair	265-5215	Mike Woolridge	265-0355
Craig Brawner	586-3321	Kristi Kline	265-9031
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Copies of abstracts or written suggestions should be sent to:

**Bill Bahr
State of Montana
Planning Prevention & Assistance Division
P.O. Box 200901
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MONTANA SECTION AMERICAN WATER WORKS ASSOCIATION

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Coauthors: _____

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For more information, call 1-800-666-0206, or if outside U.S. and Canada, call 1-703-684-2452 • FAX: 1-703-684-2492

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Postage Requirement: Dues allocated for publications when included in membership: WE&T—\$40; Water Environment Research—\$40; Industrial Wastewater—\$40; Federation Highlights—\$15; Operations Forum—\$25; Water Environment Regulation Watch—\$35; Water Environment Laboratory Solutions—\$35; Biosolids Technical Bulletin—\$89.

Water Environment & Technology

The monthly membership publication of the Water Environment Federation, *Water Environment & Technology* presents timely coverage of regulatory, technological and management issues for the wastewater field. In addition to news and in-depth features, the magazine includes departments such as Viewpoints, Legal Perspective and Problem Solvers.

Water Environment Research

Developed to serve the needs of engineers, scientists, researchers, academics, and other professionals interested in new assessment methods, water and wastewater treatment processes, and water problems and solutions.

Operations Forum

Operations Forum is the first monthly magazine dedicated exclusively to the needs of operations and maintenance personnel and others involved directly and indirectly with wastewater treatment facilities. The *Forum* covers plant management, safety, collection systems, process control, job opportunities, and more.

Water Environment Laboratory Solutions

This bimonthly newsletter covers water and wastewater analysis topics. *Water Environment Laboratory Solutions* delivers up-to-date information and solutions to everyday problems experienced by labs.

Industrial Wastewater

Industrial Wastewater is a bimonthly magazine for anyone interested in the application of science, regulations and technology to industrial wastewater management and related activities. The magazine covers a variety of issues, including regulations, treatment technologies, resource recovery and recycling, and pollution control strategies, as well as hazardous waste, air pollution control, and soil and groundwater remediation.

Water Environment Regulation Watch

A monthly newsletter covering legislative and regulatory issues and topics of interest to the water quality industry. *Water Environment Regulation Watch* covers such topics as budgets, Superfund, Clean Water Act, RCRA, and more.



Federation Highlights

The Federation's membership newsletter, *Federation Highlights*, keeps you up-to-date on current events in the field, happenings at the Water Environment Federation, members "on the move," and Member Association news.

Biosolids Technical Bulletin

NEW! The only technical newsletter covering every aspect of biosolids management. *Biosolids Technical Bulletin* is specifically designed for technical professionals who are involved in any aspect of biosolids processing, handling, management, beneficial use or disposal.

Please help us to serve you better by using the codes below to complete section 2 of the membership application.

Employer Code (select one) What is the primary business of your organization? Government 00 Administration and/or enforcement of government environmental programs 01 Municipal pretreatment programs 02 Administration of public health programs 03 Publicly owned municipal or district sanitary, water, or wastewater treatment system or plant processing >1 mgd or 44 L/sec 04 Publicly owned municipal or district sanitary, water, or wastewater treatment system or plant processing ≤1 mgd or 44 L/sec Manufacturing 20 Food and Kindred Products 22 Textiles 26 Paper and Allied Products 28 Chemical 29 Petroleum 30 Rubber and Plastics 33 Primary Metal Industries 34 Fabricated Metals		35 Industrial and Commercial Machines 36 Electronics 37 Transportation Equipment 39 Miscellaneous Manufacturing 40 Other: (please specify) _____ Other 05 Privately owned municipal or district sanitary water, or wastewater treatment system or plant 06 Privately owned industrial waste treatment facility 07 Independent Environmental Laboratory 08 Mining 09 Consulting Engineer and Contractor 10 Electric/gas Utility 11 Manufacturer of Pollution Control Equipment 12 Educational Institution 13 Retired 14 Law Firm 16 Manufacturer's Representative 19 Other: (please specify) _____	Job Title Code (select one) Select the function that best describes your activity in water and environmental management. Public or Private System Management and Operations 44 Collection Systems Management 45 Manage Plant 46 Manage Plant Operations 47 Operations 48 Lab Manager 49 Lab Technician Industrial 50 Corporate responsibility for environmental management 51 Manage all environmental operations at this location 52 Supervise subgroup in environmental operations 53 Provide staff environmental service 54 Operations Consulting 55 Executive Management 56 Division Management 57 Engineering, Non-management 58 Scientific, Non-management Other 59 Independent Lab Manager/Executive 60 Independent Lab Technician 61 Public Official (elected or appointed) 62 Professor 63 Marketing and Sales 64 Lawyer 65 Student 66 Other: (please specify) _____
Environmental Focus (select up to five that apply) 67 Wastewater 68 Drinking Water 69 Process Water 70 Coastal, River, Lake Ecology/Surface Water 71 Toxic and Hazardous Materials 72 Solid Waste		73 Air 74 Groundwater 79 Residuals/Biosolids Management 81 Public Education/Information 89 Other: (please specify) _____	



AMERICAN WATER WORKS ASSOCIATION INDIVIDUAL MEMBERSHIP APPLICATION

Complete and FAX/mail this form to:
FAX (303) 795-1989 Phone (303) 794-7711
AWWA/6666 W. Quincy Avenue/Denver, CO 80235

For AWWA Use Only.

Have you been a member of AWWA before? _____
When? _____
Member No. _____

Please furnish your preferred mailing address below (indicate whether business or home): ☐ Business ☐ Home

☐ Mr.
☐ Mrs.
☐ Ms.
☐ Dr.

First Name	Middle Initial	Last Name	Suffix
Exact Street Address		(P.O. Box or Mail Stop)	
City	State or Province	Zip or Postal Code	
Title			
Company Name			
Home Phone	Business Phone	Business Fax	
Applicant's Signature			Date
Signature of AWWA Member Endorsing Application (Optional)			Endorsing Member Number
Is your company a current member of AWWA? _____ If not, please provide your company's main address if different from above:			
Company Name			
Main Business Address			

ANNUAL DUES:

\$80/Active
Grade Code 02

\$35/Operations
Grade Code 06
(For operator level personnel or employees
of small utilities. Will not receive *Journal AWWA*.)

\$25/Student
Grade Code 14

ANNUAL DUES \$ _____

Special Assessment* _____

Multi-Section Option† _____

TOTAL DUE \$ _____

Make check payable to AWWA (Canadian funds add 30%).

☐ MasterCard ☐ VISA ☐ Diner's Club

☐ American Express ☐ Send Invoice

Card Number _____

Expiration Date _____

PREPAYMENT OF ONE YEAR'S DUES REQUIRED
No action can be taken on this application until
payment is received.

*Mandatory assessments are as follows: If your section is Connecticut or Florida, add \$10 for 02 active only. In the Georgia Section add \$15 for 02 active and 06 operations. In the Pacific Northwest Section add \$8 for 02 active only. If your section is Minnesota or South Carolina add \$10 for either 02 active or 06 operations. In the New England Section add \$40 for 02 active or \$17 for 06 operations. For the New York Section, add \$15 for 02 active or \$8 for 06 operations. Enter the total on the line reading "Special Assessment."

ALL APPLICANTS SHOULD COMPLETE THIS SECTION:

Circle the descriptions below that best describe you. The information is used in audits of AWWA readership. Circle only ONE in each group.

BUSINESS AND INDUSTRY

- A. Public Water Supply Utility—Municipally Owned
- B. Public Water Supply Utility—Investor Owned
- C. Governmental—Federal, State, Local
- D. Consultant
- E. Contractor
- F. Private Industrial Systems or Water Wholesaler
- G. Manufacturer of Equipment & Supplies including Representatives
- H. Distributors of Equipment & Supplies including Representatives
- I. Educational Institutions, Faculty and Students, Libraries, and Other Related Organizations
- J. Fully Retired
- K. Research Labs
- L. Unreported

CHECK FIELD(S) SERVED:

- 5 ☐ Water Supply Only 7 ☐ Wastewater Only
9 ☐ Both 3 ☐ Other

JOB TITLE

- A. Executive-Gen'l Mgr., Commissioner, Board Member, City Mgr., Mayor, President, Vice-President, Owner, Partner, Director, etc.
- B. Management-Division Head, Section Head, Mgr., Chief Engineer, Comptroller, etc.
- C. Engineering/non-managerial-Civil Engr., Mech. Engr. Envir. Engr., Planning Mgr., Field Engr., Systems Designer, etc.
- D. Scientific/non-managerial-Chemist, Biologist, Biophysicist, Researcher, Analyst, etc.
- E. Purchasing-Purchasing Agent, Procurement Specialist, Buyer, etc.
- F. Operations-Foreman, Operator, Maintenance, Crewman, Service Rep., etc.
- G. Marketing & Sales/non-managerial-Mkt. Analyst, Mkt. Rep., Salesman, Sales Rep., etc.
- H. Other (describe) _____

AWWA maintains profile data for use in developing additional programs and services to meet the diverse needs of our members.

Birth Date _____/_____/_____

Race/Ethnic Identification: (check one)

☐ 1 American Indian/Alaskan Native

☐ 2 Asian/Pacific-Islander

☐ 3 African American

☐ 4 Hispanic

☐ 5 White (Non-Hispanic)

Gender: (check one)

☐ F Female

☐ M Male

Completion of this information is optional.

† MULTI-SECTION

MEMBERSHIP OPTION

You may also select a year's membership in **other** AWWA sections. Circle your choice(s) and include \$14 for each section circled, **except** if your multisection option includes any of the following: for the New England Section, add \$54.00; for Pacific Northwest add \$22.00; for Connecticut, Minnesota and South Carolina add \$24.00; for Georgia and New York add \$29.00. Enter the total on the line reading "Multi-Section Option".

CIRCLE SECTION CHOICES

AKA	ALASKA	IWA	IOWA	† PAC	PACIFIC NORTHWEST (OR, WA & WESTERN ID)
ALA	ALABAMA-MISSISSIPPI	KAN	KANSAS	PEN	PENNSYLVANIA
ARI	ARIZONA	KNT	KENTUCKY-TENNESSEE	PRT	PUERTO RICO
ATC	ACWWA (NB, NF, NS, PEI)	MEX	MEXICO	QUE	QUEBEC
BRC	BRITISH COLUMBIA (BC, YT)	MIC	MICHIGAN	RMT	ROCKY MOUNTAIN (CO, NM, WY)
CAL	CALIFORNIA-NEVADA	† MIN	MINNESOTA	† SCR	SOUTH CAROLINA
CHS	CHESAPEAKE (DE, DC, MD)	MOU	MISSOURI	SDK	SOUTH DAKOTA
† CON	CONNECTICUT	MTN	MONTANA	SOW	SOUTHWEST (AR, LA, OK)
FLA	FLORIDA	NEB	NEBRASKA	TEX	TEXAS
† GEO	GEORGIA	NEJ	NEW JERSEY	VIR	VIRGINIA
HWI	HAWAII (GUAM)	† NEY	NEW YORK	WEC	WESTERN CANADA (AB, MB, NT, SK)
ILL	ILLINOIS	NOC	NORTH CAROLINA	WEV	WEST VIRGINIA
IND	INDIANA	OHO	OHIO	WIS	WISCONSIN
INT	INTERMOUNTAIN (UT & EASTERN ID)	ONT	OWWA (ON)		

The following information is for USPS 2nd class mailing requirements ONLY: In some AWWA sections, a portion of the section allotment equal to 50 percent or more of the domestic subscription rate charged for the section periodical will be allocated toward a subscription of that periodical.
Dues allocated for each publication members receive: *Journal* \$28 *MainStream* \$6 *Opflow* \$5

Check Out the Benefits of AWWA Membership

[illegible]

THE 63RD ANNUAL WATER SCHOOL FOR WATER & WASTEWATER OPERATORS & MANAGERS PROGRAM

(Please note: NO CEC's will be given for the Basic sessions.)

JOINT MORNING SESSIONS: MONDAY, SEPTEMBER 23, 1996			
TIME	BALLROOMS B, C, and D		
7:30 AM	Registration		
8:30 AM	Welcome to the 63RD Annual Fall School		
8:40 AM 0.05cec	Dorothy Bradley; Dr. Warren Jones; Jan Boyle; Rick Cottingham; Bill Bahr		
	Address to the Fall School: 1996 Amendments to the Safe Drinking Water Act		
	The Honorable Senator Max Baucus		
9:00 AM 0.05cec	Operator Certification		
	Shirley Quick		
9:30 AM	Break		
9:45 AM 0.125cec	Permitting, Planning and Enforcement Divisions: The New DEQ		
	Jan Sensibaugh, Van Jamison, and John Arrigo		
11:00 AM 0.1cec	The Biofilm Research Center		
	Dr. Costerton		
12:00 PM	Lunch		
CONCURRENT AFTERNOON SESSIONS: MONDAY, SEPTEMBER 23			
TIME	BALLROOM D (Basic)	BALLROOM B (Joint Water Treatment Session)	BALLROOM C (Joint Wastewater Session)
1:00 PM	Certification Shirley Quick	SDWA Reauthorization Jim Melstad 0.1cec	Wastewater Treatment in Montana Bill Bahr 0.2cec
2:00 PM	Scientific Terms Cavin Noddings	Phase II & V Update Craig Pagel 0.05cec	
		(2:30) Lead & Copper Update Richard Knatterud 0.05cec	
3:00 PM	Water School Vendor Show (Rooms 275/276)		

CONCURRENT MORNING SESSIONS: TUESDAY, SEPTEMBER 24, 1996

TIME	BALLROOM D (Basic)	BALLROOM B	BALLROOM C	ROOM 275	ROOM 276
8:00 AM	Conversion Factors Betsy Wahl	Turbidity & Particle Counting Jack Firkins 0.1cec	Distribution Systems Operation & Maintenance Cavin Noddings 0.1cec	Bozeman Collection System and I/I Study Ray Armstrong 0.1cec	Watersheds Jan Boyle 0.1cec
9:00 AM	Geometry: Volumes & Areas Barb Coffman	Lightning Surge Protection for System Electronics Mike O'Neill 0.1cec	Factors Affecting Regrowth Dr. Warren Jones 0.1cec	Bozeman Pretreatment Program John Paysek 0.1cec	Beneficial Use of Biosolids Paul Montgomery 0.1cec
10:00 AM	Break				
10:15 AM	Water Math: Basic Hydraulics; Capacity; Force, Pressure & Water Marc Golz	Algae Dr. Loren Bahls 0.175cec	Pumps & Motors: Operation and Maintenance Chuck Engel 0.175cec	Pollution Prevention Lara Dando; Gretchen Rupp; Mike Abrahamson 0.175cec	Water Balance Method at Lagoons Paul Klatt 0.075cec
11:00 AM					UV Disinfection Paul Klatt 0.1cec
12:00 PM	Lunch				

CONCURRENT AFTERNOON SESSIONS: TUESDAY, SEPTEMBER 24

	BALLROOM D (Basic)	BALLROOM B	BALLROOM C	ROOM 275	ROOM 276
1:00 PM	Concentration, Dosage and Volume Terry Campbell	Algae (cont.) Dr. Loren Bahls 0.2cec	Sanitary Surveys Darrell McNenny 0.1cec	Lagoon/Reservoir Dike Inspections Michelle Lenieux 0.1cec	Getting Your Infrastructure Project Off the Ground Scott Anderson 0.1cec
2:00 PM	Efficiency & Percentage; Discharge to Streams; Hydraulic Loading Rate Jerry Burns		Disinfection Procedures: Batch Dosing; Periodic Terry Campbell 0.1cec	MPDES Permits Greg Werners 0.1cec	Financing Options Barb Neuwerth 0.1cec
3:00 PM	Adjourn from Campus. Travel to Water and Wastewater Systems for Field Experience.				
3:15 PM	WATER & WASTEWATER SYSTEM TOURS FOR BASIC	Bozeman WTP WTP Staff 0.175cec	Belgrade WT System Henry Hathaway 0.175cec	Bozeman WWTP Boz. WWTP Staff 0.175cec	Belgrade Lagoons Henry Hathaway 0.175cec
5:00 PM	Adjourn				

CONCURRENT MORNING SESSIONS: WEDNESDAY, SEPTEMBER 25, 1996					
TIME	BALLROOM D (Basic)	BALLROOM B	BALLROOM C	ROOM 275	ROOM 276
8:00 AM	Lagoons Doris Roberts	Cryptosporidium Bob Clements 0.2cec	Ground Water Basics Joe Meek 0.1cec	Activated Sludge: Selectors for Filament Control at Billings Dale Rongholt 0.1cec	Wastewater Treatment in Lagoons: Theory Frank Little 0.1cec
9:00 AM	Lagoons (cont.) Doris Roberts		Wellhead Protection Joe Meek 0.1cec	Activated Sludge: BNR Operation at Missoula Starr Sullivan 0.1cec	Wastewater Treatment in Lagoons: Design Frank Little 0.1cec
10:00 AM	Break				
10:15 AM	Wastewater Treatment: Activated Sludge Paul LaVigne	Discussions on Problem-solving Bob Clements and John Camden 0.175cec	Montana's Aquifers Carole Mackin 0.1cec	Activated Sludge: Facility Planning Activities at Havre Kristi Kline 0.1cec	Wastewater Treatment in Lagoons: Operation Doris Roberts 0.1cec
11:15 AM	Wastewater Treatment: Activated Sl. (cont.) Todd Teegarden		GWUDISW Eric Regensberger 0.075cec	Activated Sludge: Ammonia Removal at Bozeman Gary Hendrix 0.075cec	Troubleshooting Lagoons Doris Roberts 0.075cec
12:00 PM	Lunch				
CONCURRENT AFTERNOON SESSIONS: WEDNESDAY, SEPTEMBER 25					
TIME	BALLROOM D (Basic)	BALLROOM B	BALLROOM C	ROOM 275	ROOM 276
1:00 PM	Basic Ground Water Systems Barb Coffman	Filter Interface Monitoring Joe Steiner 0.1cec	Gallatin Co. Water Quality District Pat Zurick and Jackie Stonell 0.1cec	Activated Sludge: Oxidation Ditch at Miles City Al Kelm 0.1cec	Lagoon Self-Assessment Mike Abrahamson 0.1cec
2:00 PM	Distribution System Basics Terry Campbell	Filter Evaluation Shelley Nolan 0.1cec	Local DES Coordinators Aaron Holst 0.1cec	Activated Sludge: RBC Plant at Livingston Steve Briggs 0.1cec	Health Hazards at WWTPs Kenny Lynn 0.1cec
3:00 PM	Break				
3:15 PM	Water Treatment Overview John Camden and Rick Cottingham	Tracer Testing Paul Walker 0.075cec	Cross-Connections Marc Golz 0.075cec	Joint Wastewater - Rooms 275/276 Wastewater Microbiology Dr. Warren Jones 0.075cec	
4:00 PM		Start-Up Experience Tim Miller 0.1cec	Planning Ahead/CDBG Barry Damschen 0.1cec	Wastewater Microbiology Lab Various Staff 0.1cec	
5:00 PM	Adjourn				

JOINT MORNING SESSIONS: THURSDAY, SEPTEMBER 26, 1996

TIME	BALLROOM B/C	BALLROOM D
8:00 AM	Chlorine Systems: Operation and Safety Don Shipp and John Hahn 0.2cec	Safety: Confined Space Entry Sandra Stapler 0.2cec
9:00 AM		
10:00 AM		Break
10:15 AM	Chlorine Systems: Maintenance Don Shipp and John Hahn 0.125cec	Safety: Trenching & Shoring Sandra Stapler 0.125cec
11:30 AM 0.025cec Comments:	Wrap-up: School Evaluations/Closing Comments by School Director/Adjourn (11:45 AM)	
1:00 PM	General Water Treatment/Distribution Review (Room 275) NO CEC's - For Certification Exam Preparation Only	General Wastewater Treatment Review (Room 276) NO CEC's - For Certification Exam Preparation Only

REGISTER NOW FOR THE

63rd ANNUAL - WATER SCHOOL

for

WATER AND WASTEWATER OPERATORS AND MANAGERS

September 23-26, 1996

Strand Union Building, Montana State University - Bozeman

Conducted by: Montana State University-Bozeman, Montana Dept. of Environmental Quality and Montana Environmental Training Center

Topics include:

- * Adv. Surface Water Treatment
- * Discharge Permits
- * Collection Systems Maintenance
- * Wellhead Protection
- * Sanitary Surveys
- * Adv. Water Treatment
- * Safe Drinking Water Act Updates
- * Water Distribution O & M
- * Trenching and Shoring
- * Pumps and Motors
- * Wellhead Protection
- * Microbiology of Wastewater
- * Algae
- * Emergency Planning
- * Lagoon Operations
- * Chlorinator Operation, Maintenance & Safety

Registration Information:

Preregistration:	\$ 85.00 per person
On-Site Registration:	\$100.00 per person

No refunds will be issued after the school begins. A refund of registration minus \$10.00 administration cost will be provided prior to the beginning of the program. Checks and Purchase Orders should be payable to Montana State University. (No phone registrations please.)

Complete your name address and daytime phone number along with payment to:

Extended Studies
Montana State University - Bozeman
204 Culbertson
P.O. Box 172200
Bozeman, MT 59717-2200
(406) 994-6685

FOR MORE INFORMATION CALL BILL BAHR WITH THE DEPARTMENT OF ENVIRONMENTAL QUALITY AT (406) 444-5337.

Montana Department of Environmental Quality
Metcalf Building
P.O. Box 200901
Helena, Montana 59620-0901

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